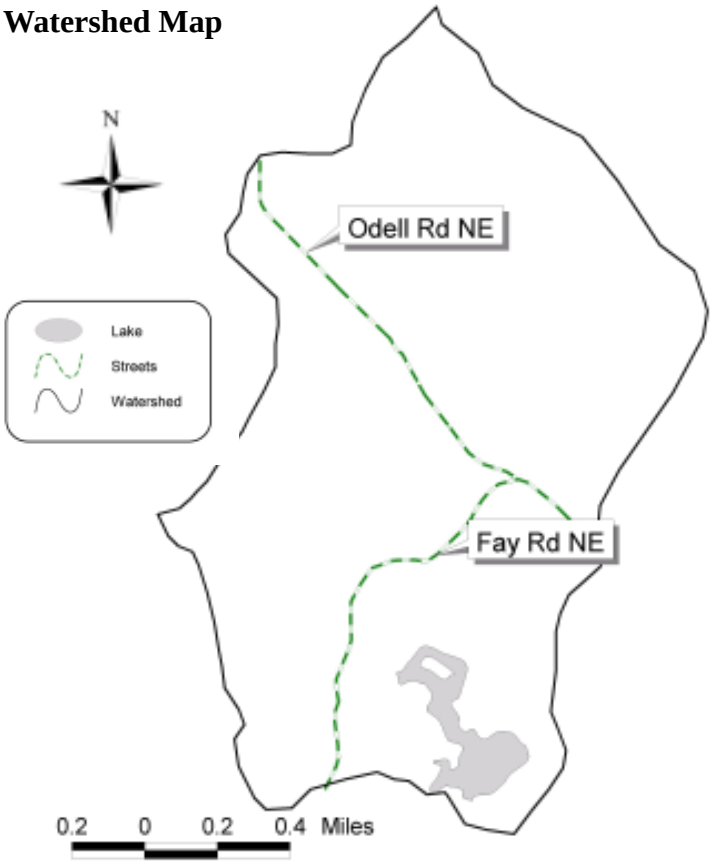
Overview

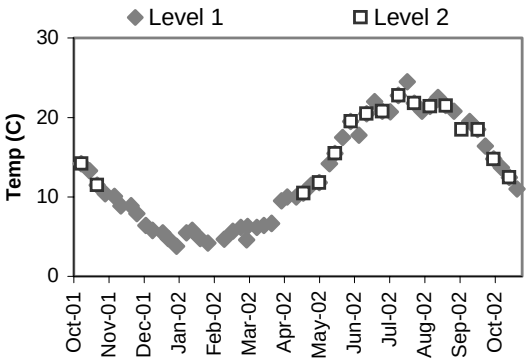
Volunteer monitoring began at Lake Marcel in 2000 and continued through 2002. The collected data suggest that this rural lake is relatively high in primary productivity (eutrophic to mesotrophic) with fair to good water quality. Since the lake surface makes up only 3% of the drainage area, direct precipitation is not as important as inlet streams, stormwater runoff and groundwater inputs. Lake Marcel is considered a Class 2 wetland in the King County Wetland Inventory (1990), and is the only wetland above Class 3 in the watershed. Current land use is predominantly rural, with suburban housing surrounding the lake.

Lake Marcel has no public access boat launch, but has a history of aquatic weed management, including stocking with grass carp. Residents should keep an eye on aquatic plants growing nearshore to catch early infestations of noxious weeds.

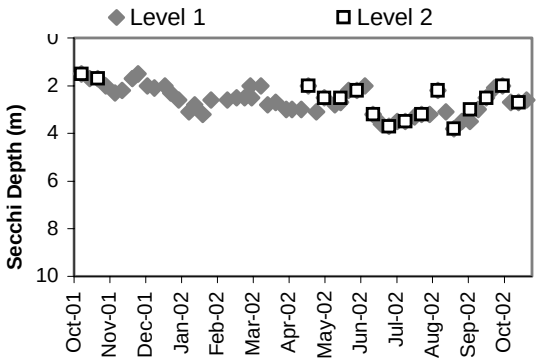
Watershed Map



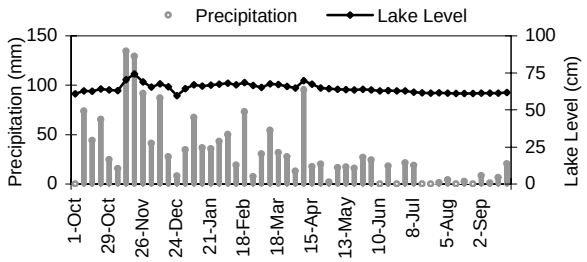
Lake Temperature



Secchi Depth



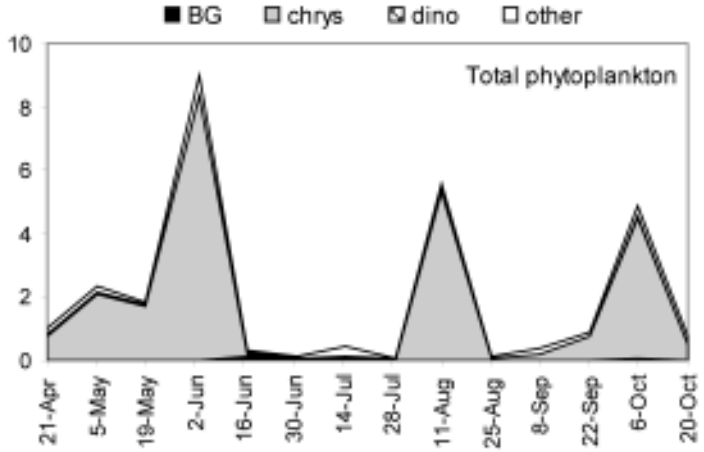
Lake Level and Precipitation



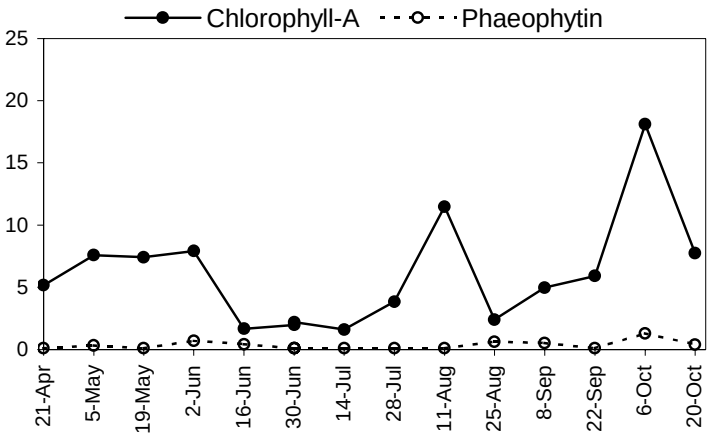
Secchi transparency ranged from 0.5 to 4.2m through the year. Water levels remained steady through the year without seasonal fluctuations. Annual water temperatures ranged from 3.8 to 24 degrees Celsius.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton population was dominated by the chrysophyte diatom *Asterionella* early in the season, reaching a peak in June. The chrysophyte alga *Dinobryon* made two peaks later in the season, in August and in early October. Other common species included several species of dinoflagellates and chlorophytes, the euglenophyte *Trachelomonas,* and the bluegreen *Anabaena.* Chlorophyll content followed the phytoplankton volumes fairly well through the sample season, but did not record the height of the diatom peak in June.



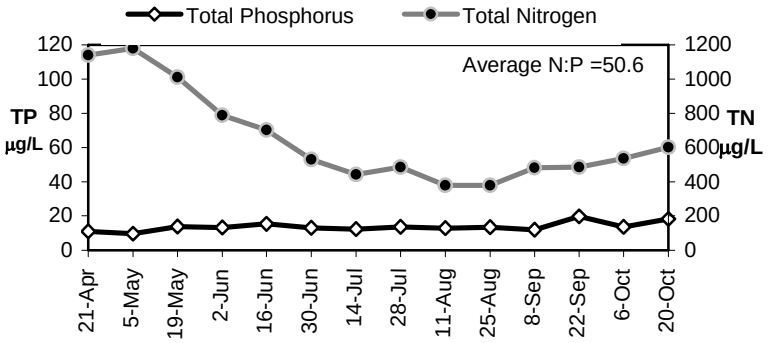
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

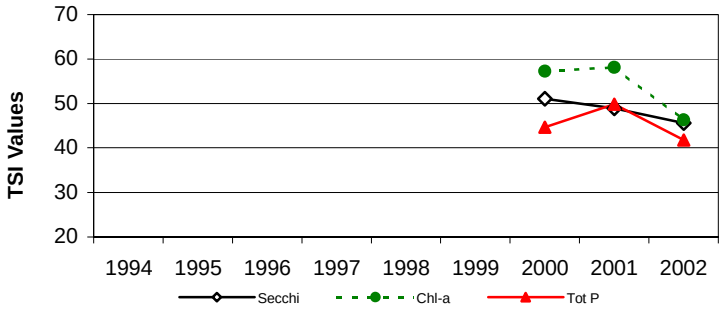


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen changed proportion to each other consistently as Total N decreased through the sampling period. The N:P ratio ranged from 25 to 122, above the bluegreen threshold of 20 most of he time.

In 2002 all three throphic state indocators were below the threshold for eutrophy and were in fairly close agreement with each other.





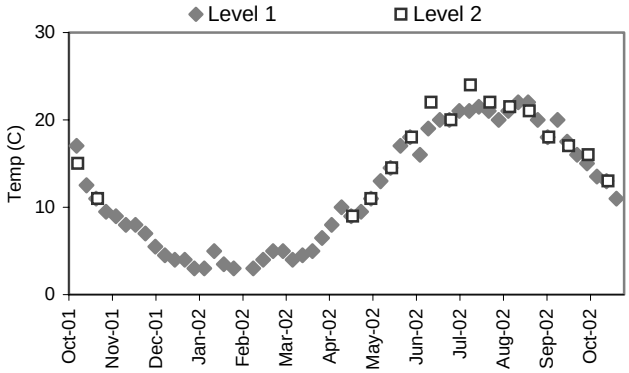
Overview

Volunteer monitoring began at Lake Margaret in 2000 and continued through 2002. The data collected suggest that this lake is relatively low in primary productivity (oligotrophic to mesotrophic) with excellent to good water quality. Since the lake surface makes up only 2.5% of the drainage area, direct precipitation is not as important as isurface and groundwater inputs. Much of the catchment basin is in Snohomish County. There are inventoried wetlands in the basin, in addition to several ponds. Current land use is predominantly rural forested, with a cluster of suburban housing surrounding the lake. Lake Margaret is a source of domestic water for homes nearby, and therefore water quality is of paramount concern.

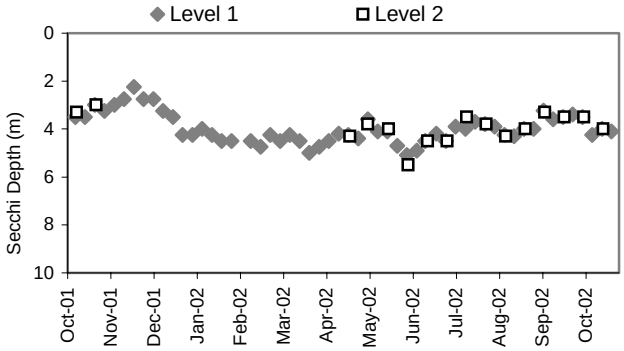
Lake Margaret has a public access boat launch, and residents should keep a watch on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea, or other noxious weeds.

Watershed Map

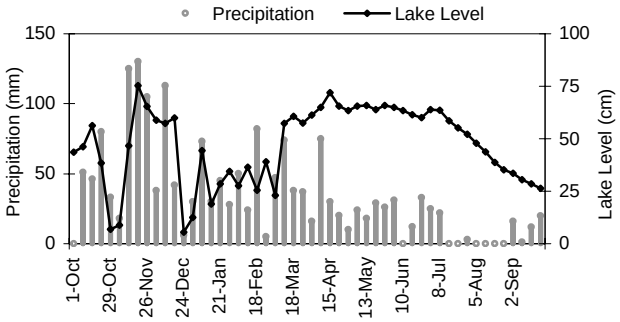
Lake Temperature



Secchi Depth



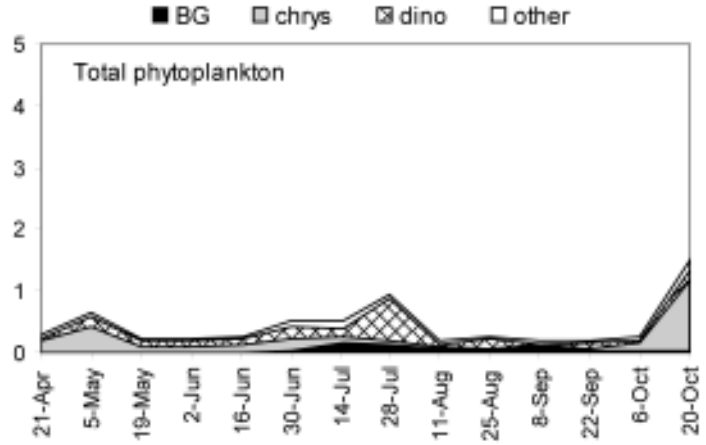
Lake Level and Precipitation



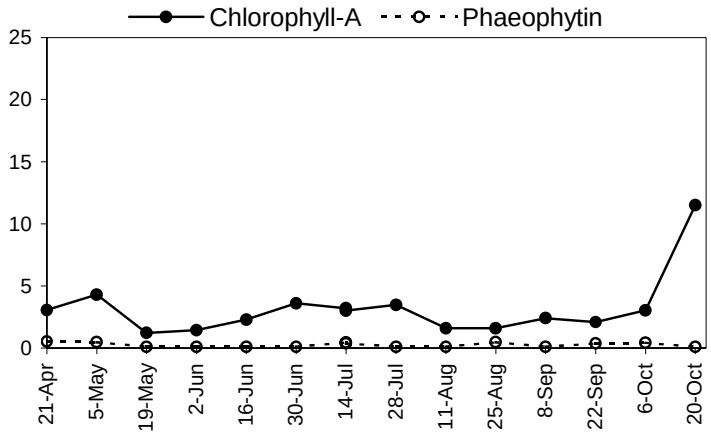
Secchi transparency ranged from 2.3 to 5.5m through the year. Water levels are controlled by the water district at the outlet, which lowers the lake in fall to receive stormwater and raises the level in spring to hold water for summer use. This management activity was reflected in the data. Annual water temperatures ranged from 3 to 24 degrees Celsius.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton populations remained low through the season, with a small peak of an unidentified dinoflagellate in late July and a growing population of the chrysophyte *Dinobryon* detected on the last sample date. Chlorophyll content followed phytoplankton volumes fairly closely through the season.



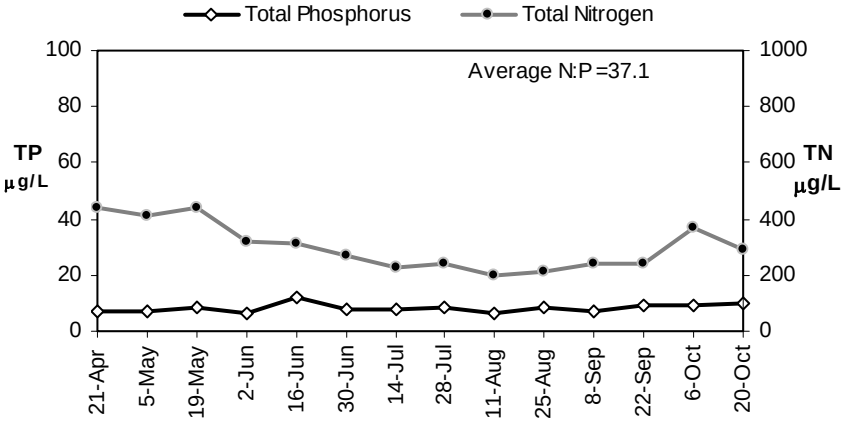
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

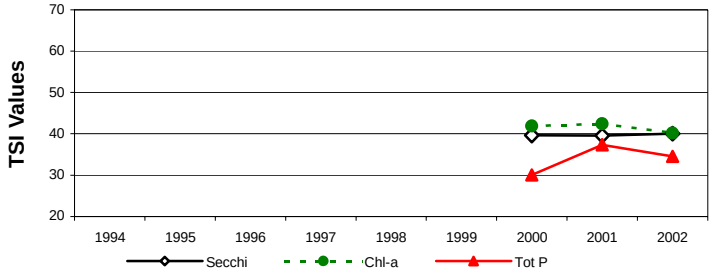


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period, with nitrogen slightly higher in the spring. The N:P ratio ranged from 24 to 63.

In 2002 the TSI values were similar to those in 2001, near the threshold between oliogtrophic and mesotrophic, but with TSI-TP lower than the other two indicators.



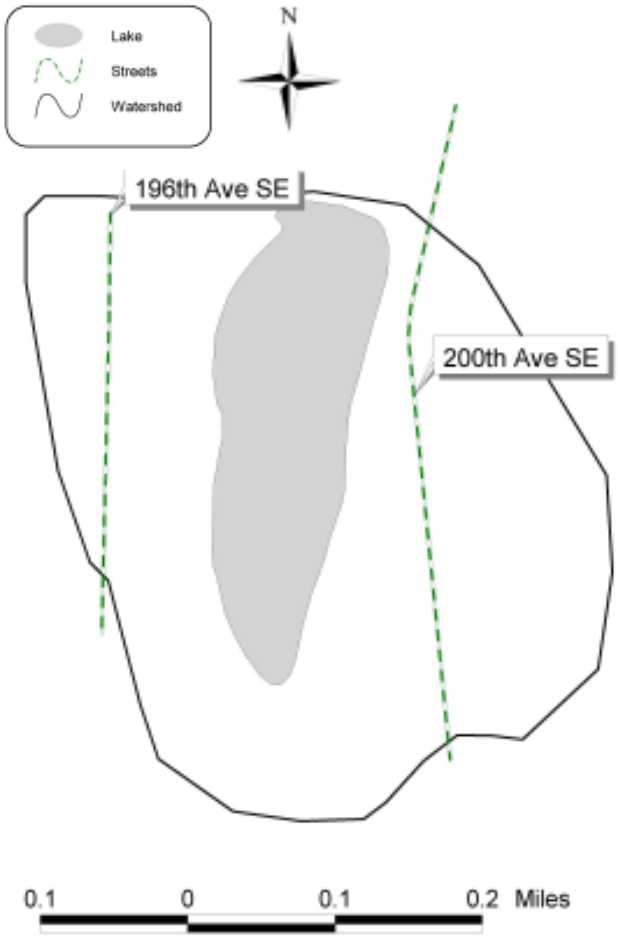


Overview

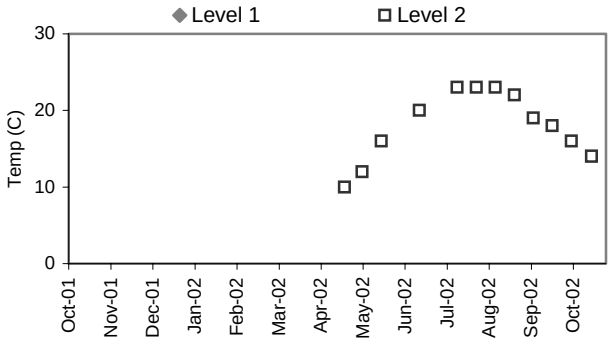
Volunteer monitoring began at Lake McDonald in 1996 and continued through 2002. The data collected suggest that this lake is decreasing in primary productivity in recent years (eutrophic to mesotrophic); currently it has good water quality. Since the lake surface makes up 19% of the drainage area, direct precipitation is important, in addition to stormwater runoff and groundwater inputs. According to King County Wetland Inventory (1990) the majority of the lake shorelineis classified as Class 1 (C) wetland. Current land use is predominantly suburban to rural residential. King County's Cedar Hills Landfill is nearby, and large seagull populations reported on the lake in the past may have contributed nutrients to the water.

Lake McDonald has no public access boat launch, but residents should keep an eye on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea, or other noxious weeds.

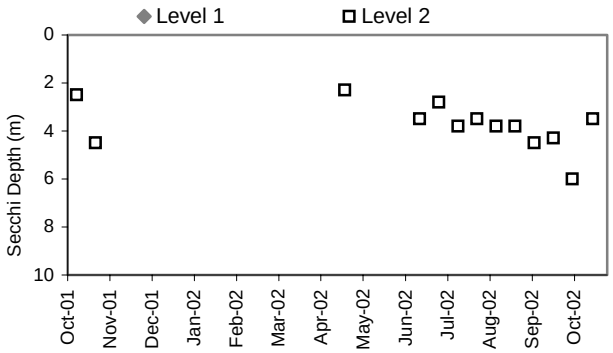
Watershed Map



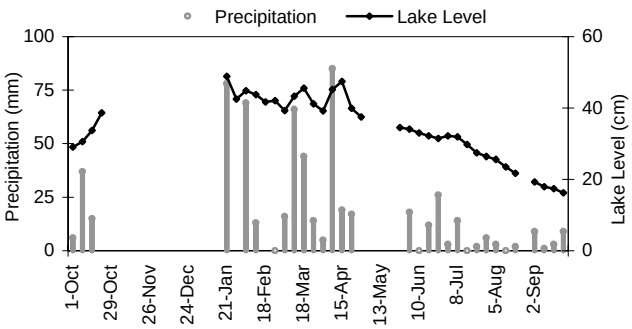
Lake Temperature



Secchi Depth



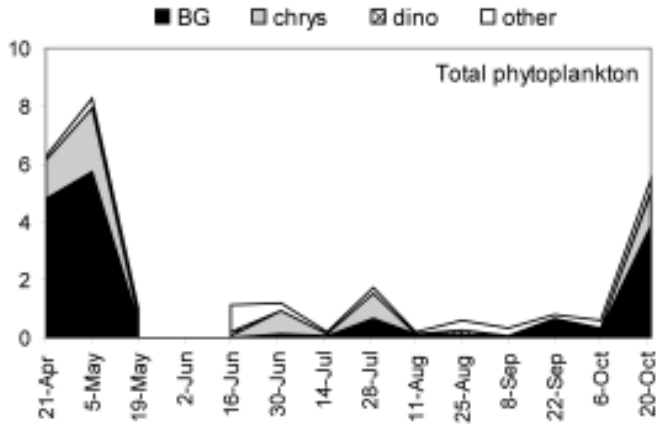
Lake Level and Precipitation



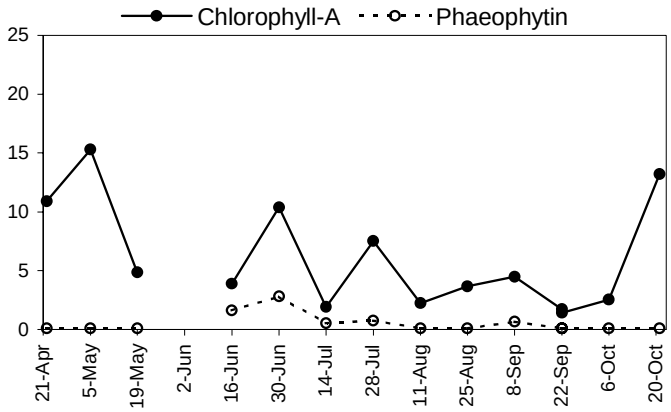
Secchi transparency data ranged from 2.3 to 6.0m. Water levels and precipitation were incomplete, but suggest a winter high - summer low pattern similar to other small lakes in the region. During the Level II sampling period, temperatures ranged from 10 to 23 degrees Celsius.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton populations were dominated at the beginning and end of the season by the bluegreen *Aphanizomenon*. It was accompanied in spring by the chrysophyte diatom *Asterionella* and in the fall by the chrysophyte *Dinobryon*. Other species present included the dinoflagellate *Ceratium*, several chlorophytes, and the euglenophyte *Trachelomonas*. Chlorophyll content recordeed the phytoplankton peaks at at each of the season, but remained higher in values than the phytoplankton would suggestin mid-season. Higher values of the chlorophyll degradation product phaeophytin in June suggest that some of the chlorophyll may have come from somewhere other than the plankton.



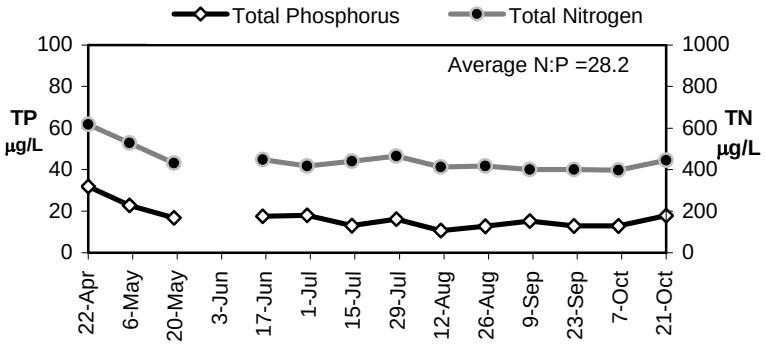
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

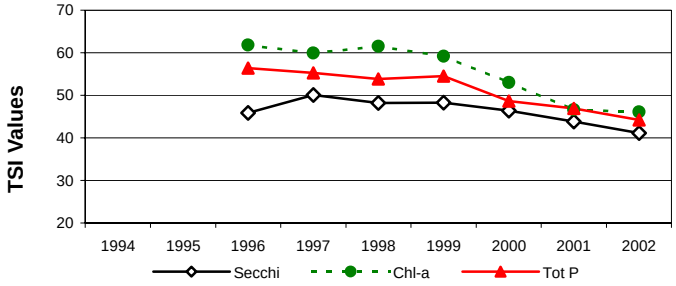


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in remarkably constant proportion to each other through the sampling period. The N:P ratio ranged from 19 to 39.

In 2002 the TSI values were in close agreement with each other, very similar to values in 2001. The indicators suggest a downward trend since 1998. The TSI-Secchi has consistently been lower than the other two indicators through the entire period of measurement.



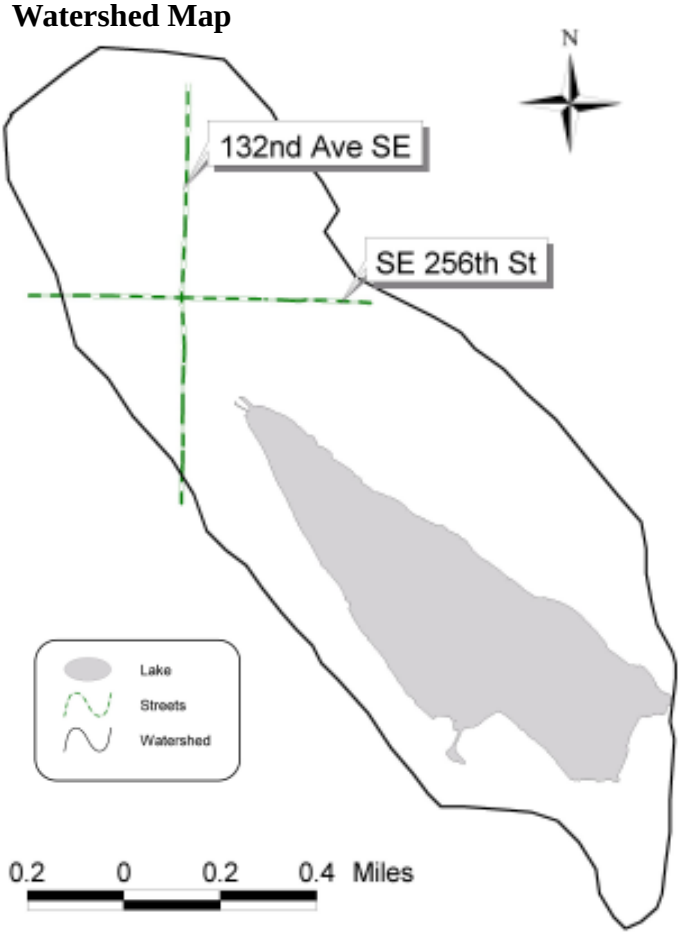


Overview

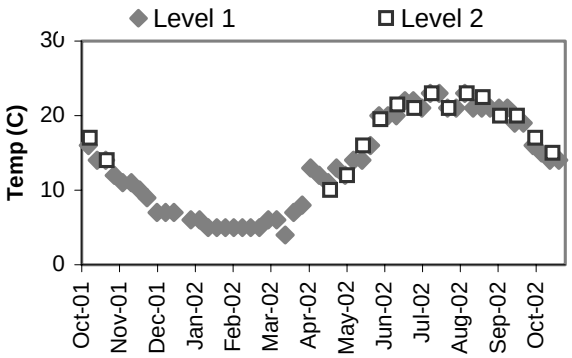
Volunteer monitoring began at Lake Meridian in the early 1980s and continued through 2002, missing only 1996. The data collected indicate this city lake (Kent) is low in primary productivity (oligotrophic) with excellent water quality. Since the lake surface makes up 20% of the drainage area, direct precipitation is important, in addition to surface and ground water inputs. The shoreline is surrounded by Class 2 shoreline wetlands according to the King County Wetland Inventory (1990). There is one small Class 2 wetland near the lake, separated from the shoreline by the Kent-Kangley Road. Current land use is predominantly urban residential, with some open space.

Lake Meridian has a public access boat launch. Eurasian milfoil is established in the lake, and plans are being made to control it. However, residents should watch for Brazilian elodea and other noxious weeds.

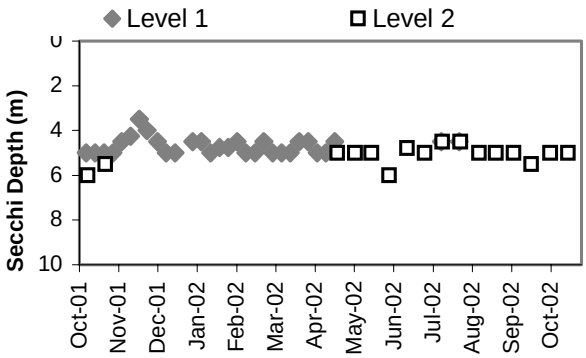
Watershed Map



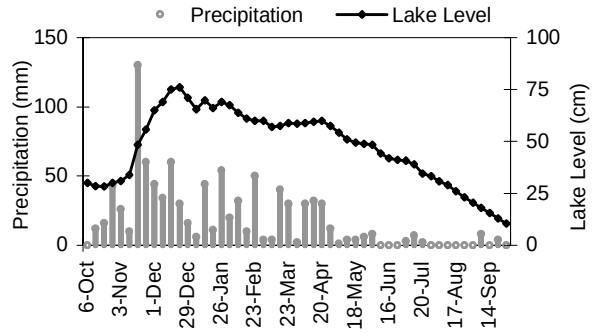
Lake Temperature



Secchi Depth



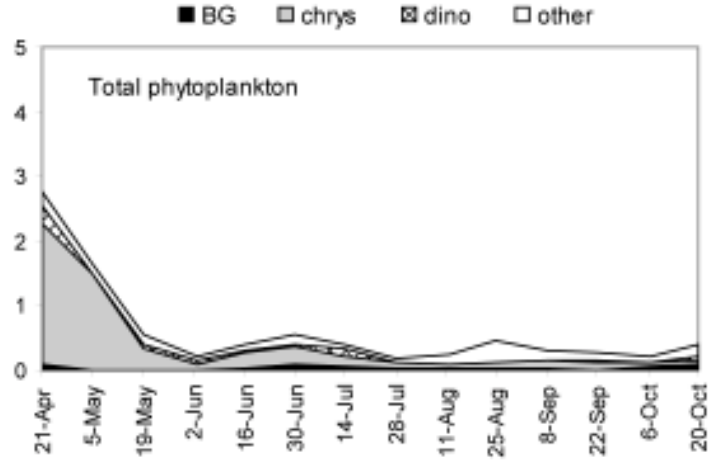
Lake Level and Precipitation



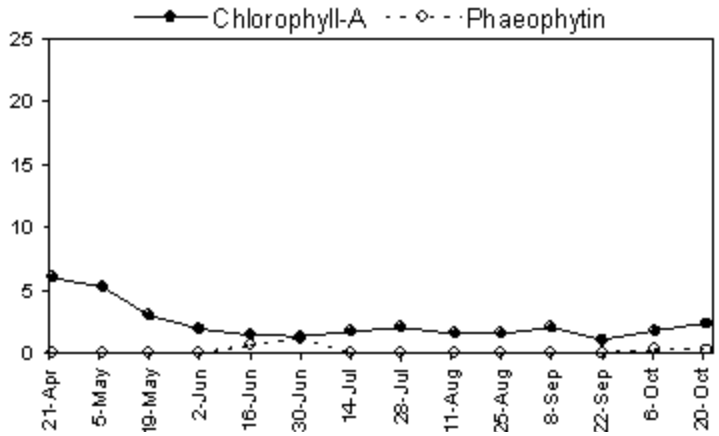
Secchi transparency ranged from 3.5 to 6.0m through the year. Water level records were nearly complete, detailing a winter high-summer low pattern similar to other small lakes in the region. Annual water temperatures ranged from 4 to 23 degrees Celsius.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton populations remained low through the sample season, with the largest populations recorded on the first two sampling dates. The first part of the sample season was dominated by the chrysophyte *Dinobryon*, with smaller amounts of the diatoms *Tabellaria* and *Cyclotella*. Important algae later in the season included the chlorophyte *Botryococcus* and the dinoflagellate *Ceratium*. Chlorophyll content followed phytoplankton volumes consistently through the season. Degraded chlorphyll (phaeophytin) remained low, with small exceptions in mid to late June.



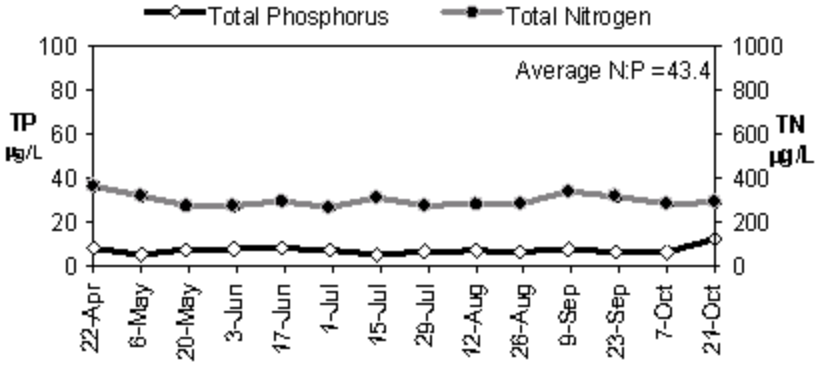
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

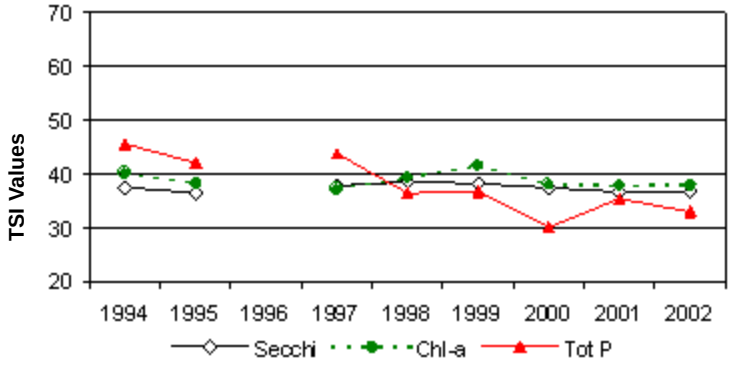


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in constant proportion to each other through the sampling period, while the N:P ratio ranged from 24 to 63.

In 2002 the TSI values were in good agreement with each other, similar to the values in 1998 and 2001. Since 1998 TSI-TP has been lower than the other two indicators, unlike previous years when it was higher.



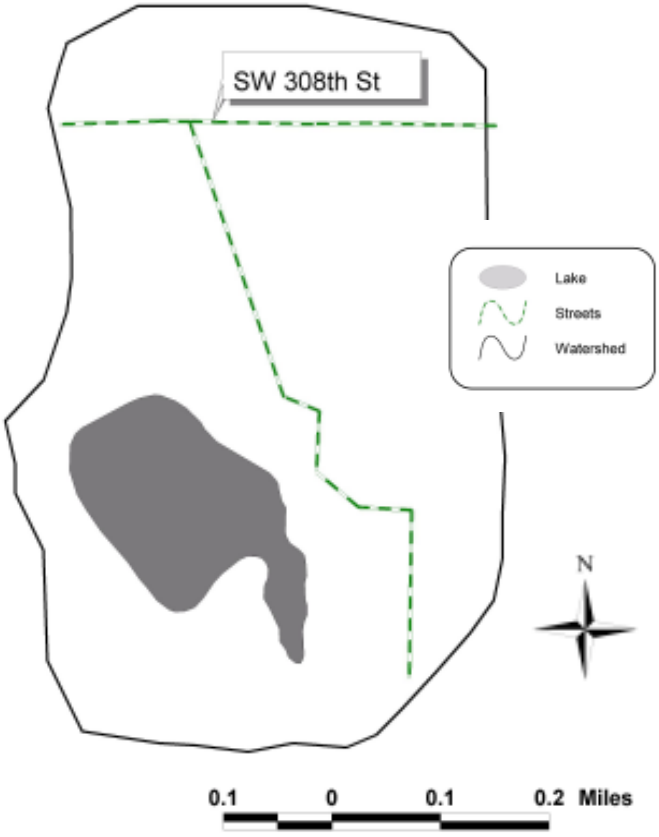


Overview

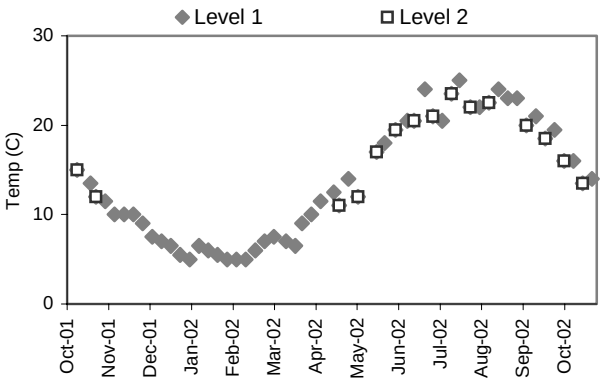
Volunteer monitoring began at Mirror Lake in the early 1997 and continued through 2002. The data collected indicate this city lake (Federal Way) is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 11% of the drainage area, direct precipitation is fairly important, in addition to surface and ground water inputs. There are no inventoried wetlands in the basin. Current land use is predominantly urban residential, with some commercial and open space.

Mirror Lake has no public access boat launch, but residents should keep an eye out for Eurasian milfoil, Brazilian elodea, and other noxious weeds.

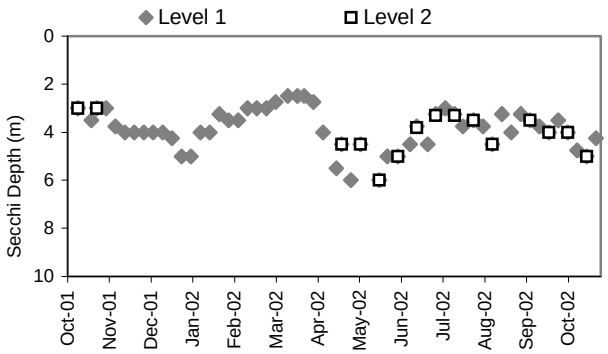
Watershed Map



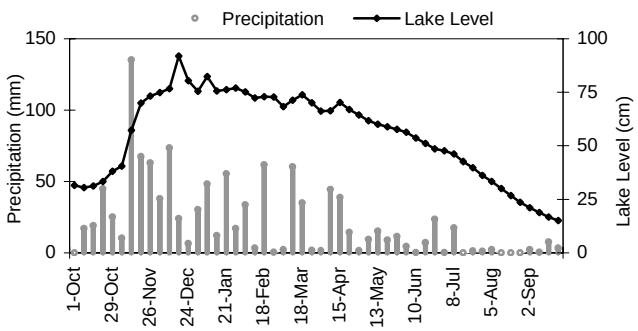
Lake Temperature



Secchi Depth



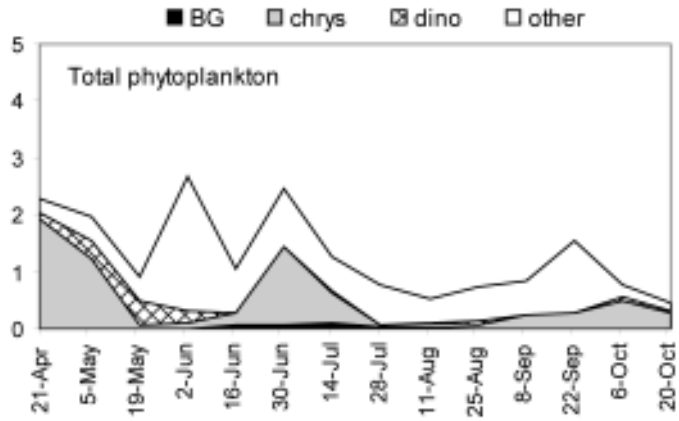
Lake Level and Precipitation



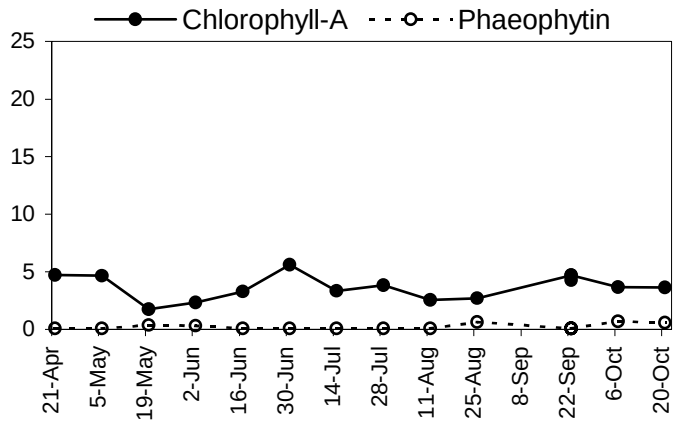
Secchi transparency ranged from 2.5 to 6.0m through the year. Excellent records were kept for precipitation and water levels. Lake level followed the winter high - summer low pattern consistent with other small lakes in the region. Annual water temperatures ranged from 5 to 25 degrees Celsius.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The early phytoplankton populations were dominated by the chrysophyte *Dinobryon*, followed by the chlorophyte *Botryococcus* for the rest of the season. Smaller amounts of the diatom *Asterionella* and the dinoflagellate *Ceratium* occurred in spring. Dinobryon was of secondary importance to *Botryococcus* from early summer through fall. Chlorophyll content generally followed phytoplankton volumes through the season, but did not mark peaks as distinctly. Degraded chlorophyll (phaeophytin) remained very low through the whole period.



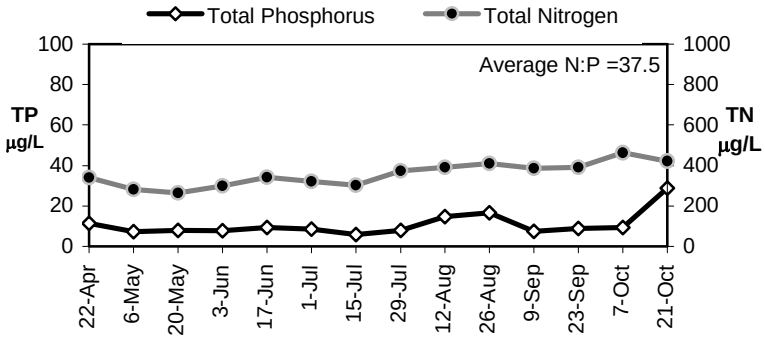
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

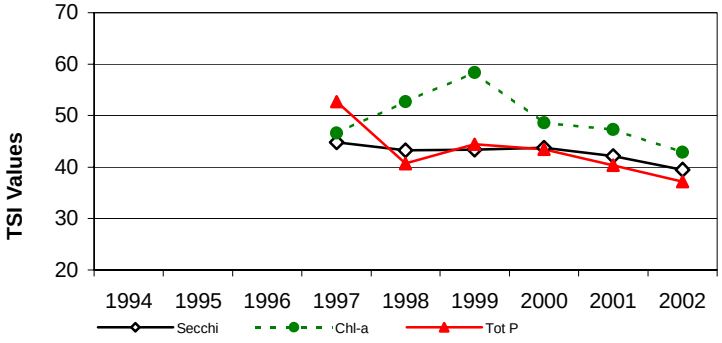


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in constant proportion to each other through much of the sampling period, although phosphorus rose significantly in the last sample. The N:P ratio ranged from 15 (on the last date) to 52.

In 2002 the average TSI-chlor was higher than the other two indicators, similar to the pattern over the past four years. Average TSI values for Secchi and Total P were on the threshold between mesotrophy and oligotrophy, while TSI-chlor was near the mid-range for mesotrophy.



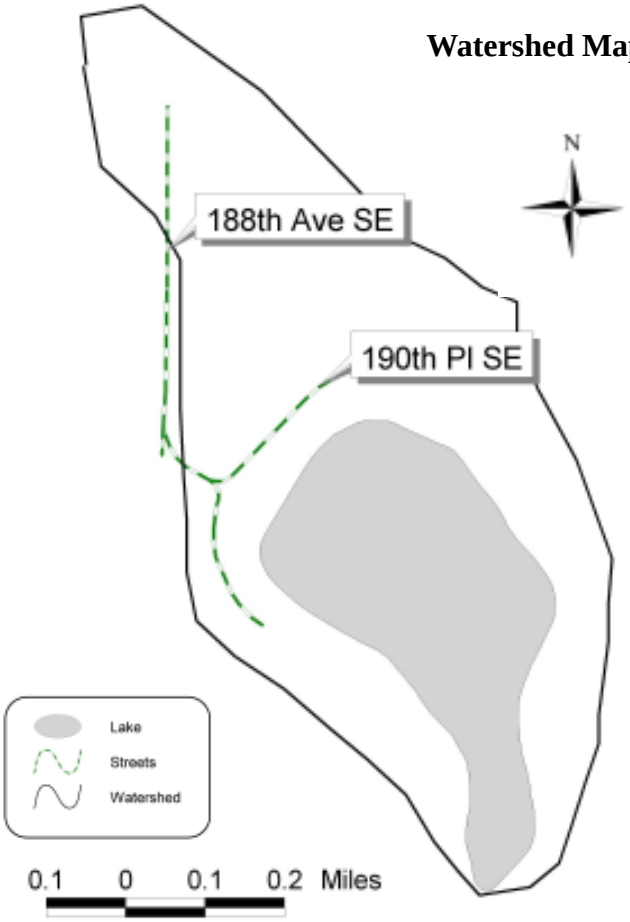


Overview

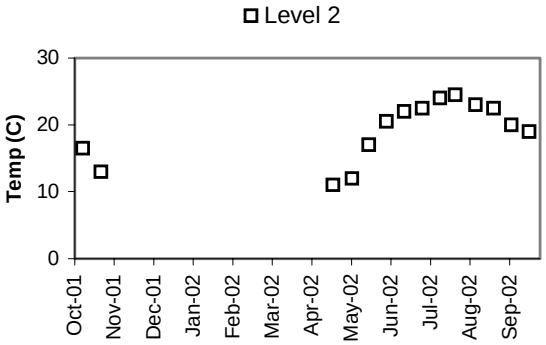
Volunteer monitoring began at Lake Morton in the early 1980s and has continued through 2002. The data collected indicate this lake is fairly low in primary productivity (mesotrophic to oligotrophic) with very good water quality. Since the lake surface makes up 26% of the drainage area, direct precipitation is very important, in addition to surface and ground water inputs. There are no class 1 or 2 wetlands in the basin (king County 1990). Current land use is mixed rural and open space, with suburban residences along the shoreline of the lake.

Lake Morton has a public access boat launch, and residents should keep a watch for early infestations of Eurasian milfoil, Brazilian elodea, and other noxious weeds.

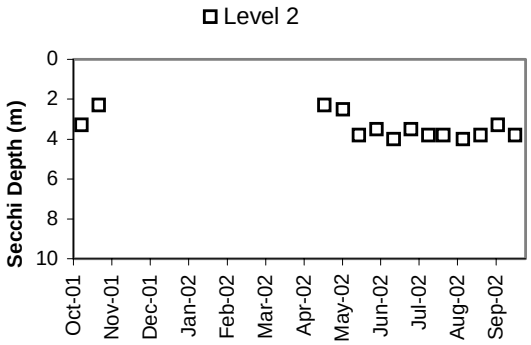
Watershed Map



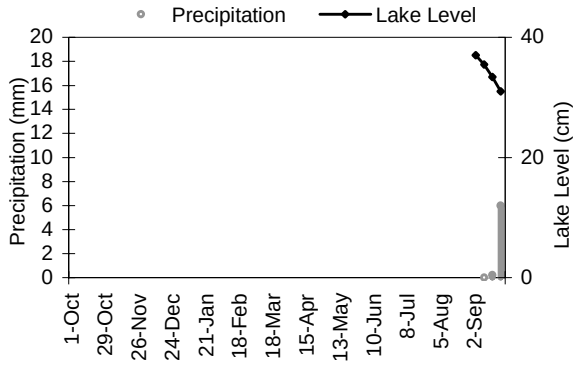
Lake Temperature



Secchi Depth



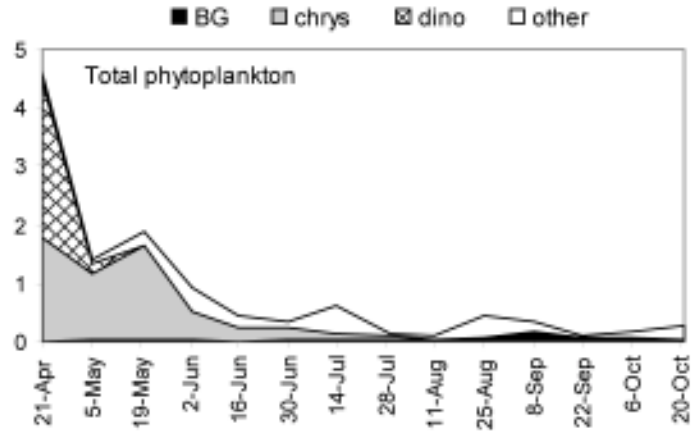
Lake Level and Precipitation



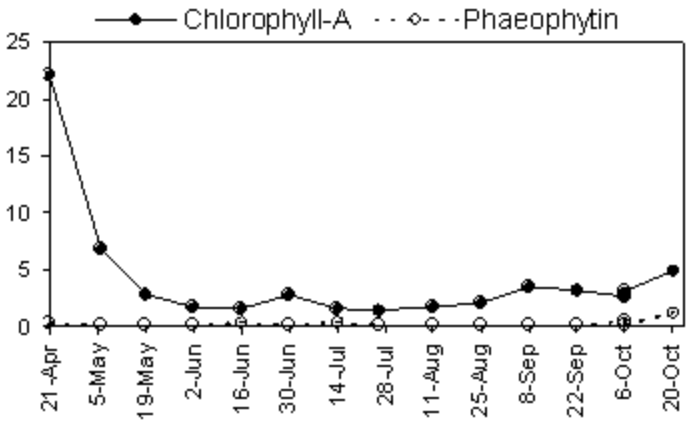
Secchi transparency during the Level II sampling season ranged from 2.3 to 4.0m. Water temperatures during the Level II sampling season ranged from 11 to 24.5 degrees Celsius. Precipitation and water level records were confined to the last month of the water year.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The highest values for phytoplankton populations were at the beginning of the year, dominated successively by the dinoflagellate *Peridineum*, the diatom *Cyclotella*, and the chrysophyte *Dinobryon*. Other species found in the lake included the cryptophyte *Cryptomonas*, the chlorophyte *Botryococcus*, and the colonial bluegreen *Aphanocapsa*. Chlorophyll content followed the phytoplankton populations closely, while degraded chlorophyll (phaeophytin) remained very low through the sampling period.

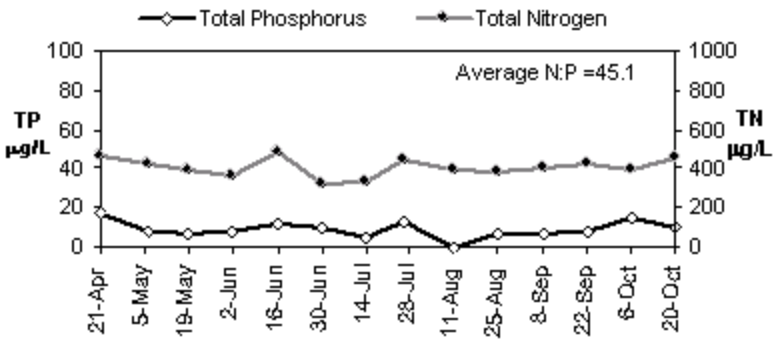


BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

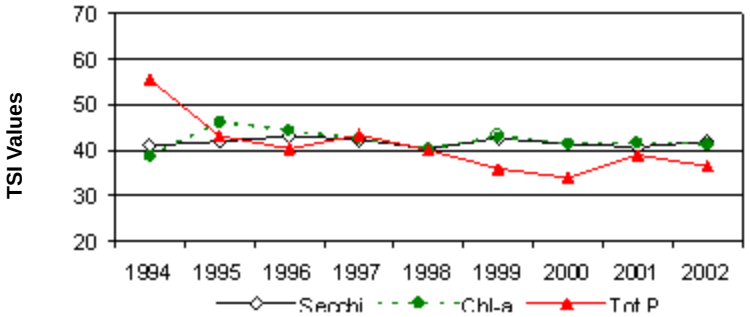


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportions to each other through the sampling period, with the N:P ratio ranging from 25 to 79.



In 2002 the average TSI values were fairly close to each other, right on the threshold between oligotrophy and mesotrophy. Both TSI-chlor and TSI-Secchi have remained close to each since 1997, while average TSI-TP was lower than the other two indicators in 2002, similar to the past three years.

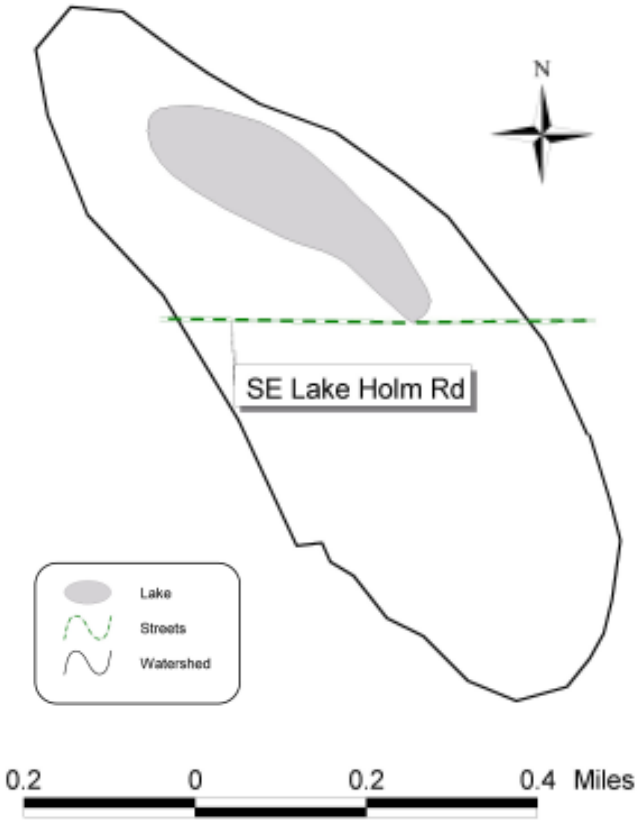


Overview

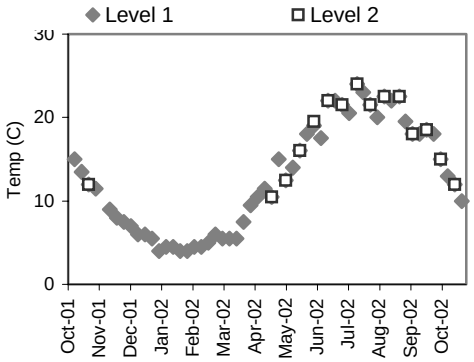
Volunteer monitoring began at Neilson (Holm) Lake in the early 1997 and has continued through 2002. The data collected indicate this lake is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 10% of the drainage area, direct precipitation is fairly important, in addition to surface and ground water inputs. The north and west shorelines of the lake are considered to be Class 2 wetland (King County 1990). Current land use is mixed rural and open space, with some suburban development along the shoreline of the lake.

Neilson Lake has a public access boat launch, and pioneering infestations of Eurasian milfoil were observed in the summer of 2001. Residents should keep an eye out for further infestations of milfoil, Brazilian elodea, and other noxious weeds.

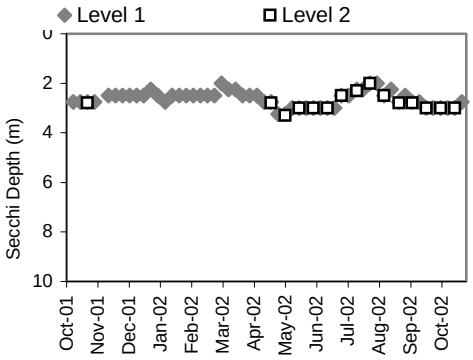
Watershed Map



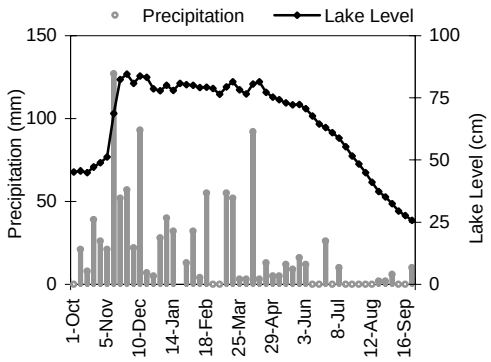
Lake Temperature



Secchi Depth



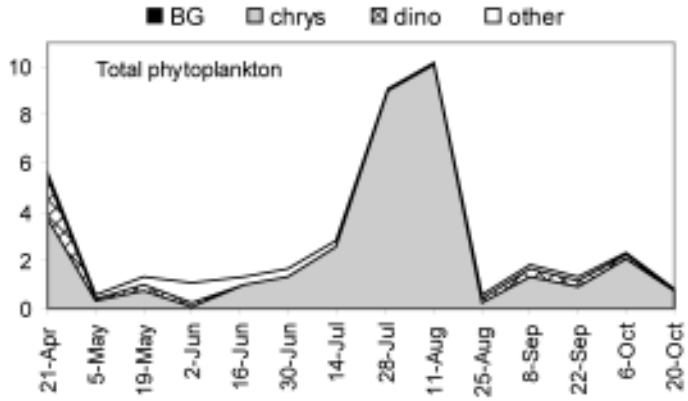
Lake Level and Precipitation



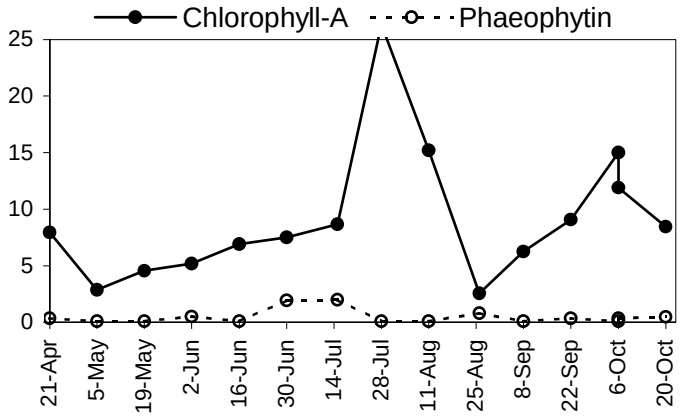
Secchi transparency was very stable, ranging from 2.0 to 3.3m through the year. Annual water temperatures ranged from 4 to 24 degrees Celsius. Excellent records showed that water levels followed a winter high - summer low pattern consistent with other small lakes in the region.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton population reached a maximum in early August, dominated by the chrysophyte *Dinobryon*, which was dominant throughout the sampling season. Other prominent species found in the lake included the dinoflagellates *Ceratium* and *Peridineum*, and the chlorophyte *Botryococcus*. Chlorophyll content tracked the phytoplankton well, but made a higher peak in October than did the phytoplankton biovolume. Degraded chlorophyll (phaeophytin) was detected in the samples leading up to the large bloom of *Dinobryon* in July-August, but was proportionally a very small amount.



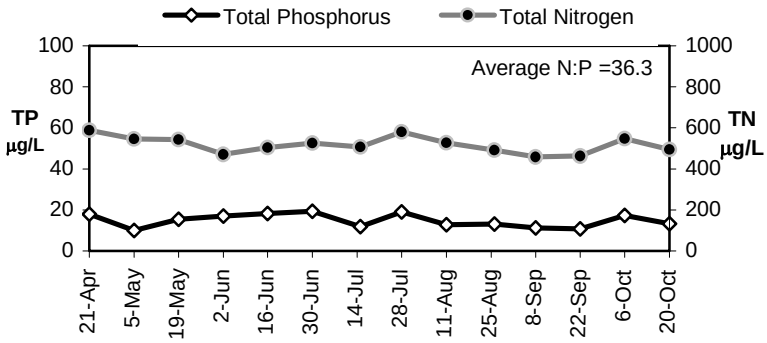
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

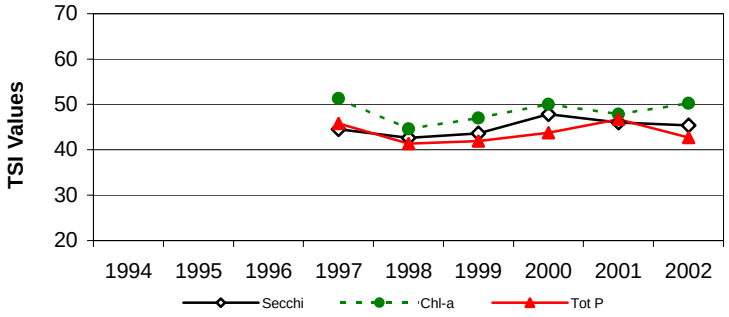


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period. The N:P ratio ranged from 27 to 55, always above the threshold for good bluegreen conditions.

In 2002 the spread of the average TSI values was similar to that of 2000, in the mid to upper range of mesotrophy. Similar to several years in the past, the average TSI-Chlor is higher than the other two indicators.



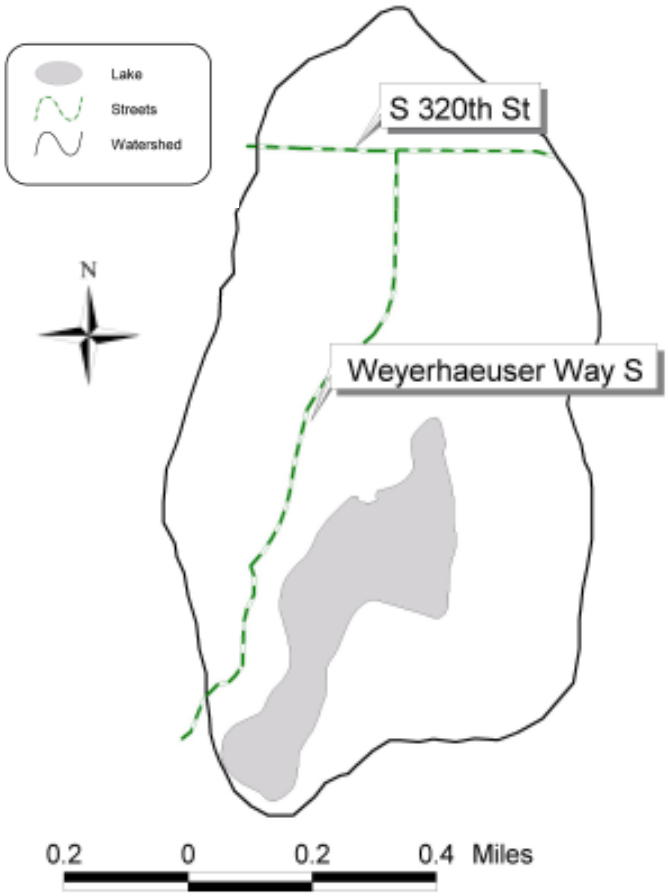


Overview

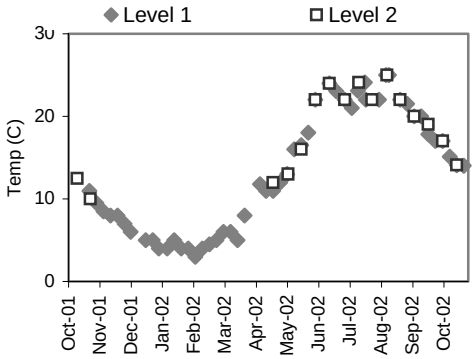
Volunteer monitoring began at North Lake in the early 1980s, was resumed in 1995 through 1998 after a hiatus and began again in 2001 through 2002. Collected data indicate this lake, whose western shoreline is in the city of Federal Way, is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 12% of the drainage area, direct precipitation is fairly important, in addition to surface and ground water inputs. The only inventoried wetland (Class 2) in the basin is along the western shoreline of the lake (King County 1990). Current land use is very mixed, with suburban residential, rural, open space and office complexes located within the catchment. Most of the western shoreline is currently in open space.

North Lake has a public access boat launch, and Eurasian milfoil has been identified in the lake. Residents should watch for the spread of milfoil as well as infestations of Brazilian elodea and other noxious weeds.

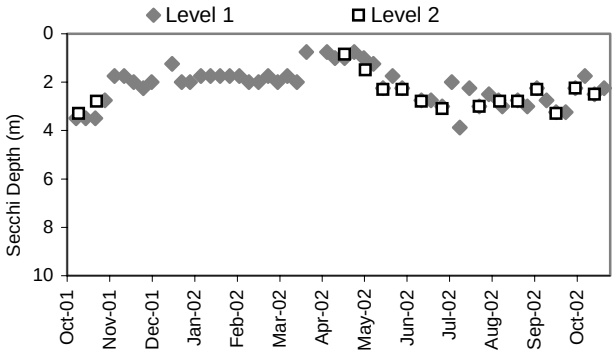
Watershed Map



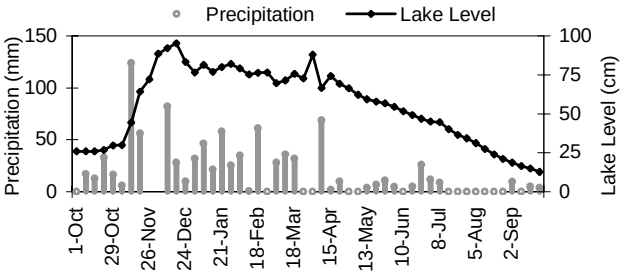
Lake Temperature



Secchi Depth



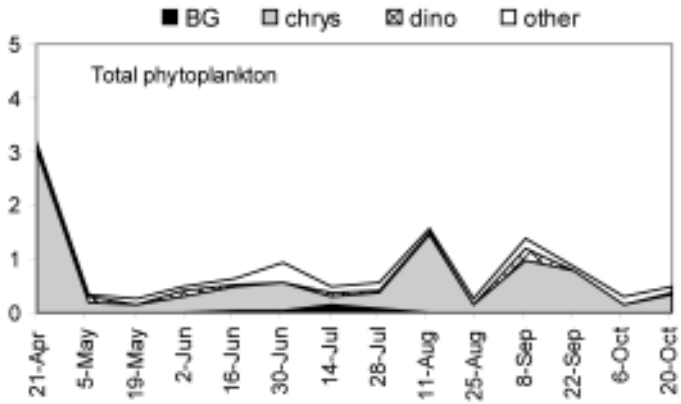
Lake Level and Precipitation



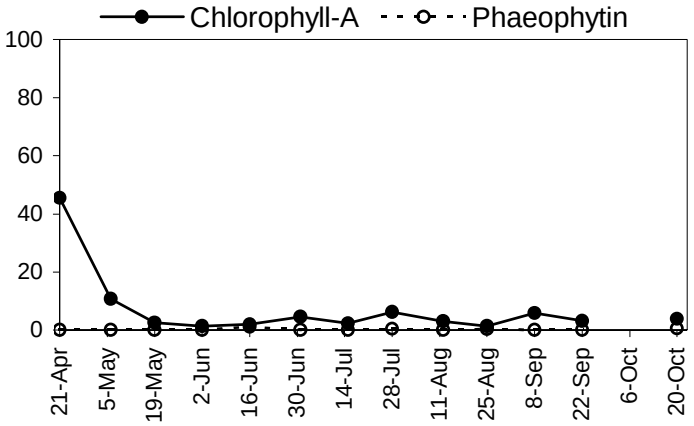
Secchi transparency ranged from 0.8 to 6.0m through the year, but was generally close to 3.0m. Annual water temperatures ranged from 3 to 25 degrees Celsius. Excellent precipitation and water records were collected for the year. Water levels followed a pronounced winter high - summer low pattern, consistent with other small lakes in the region.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton populations were low to moderate throughout the sampling season. The largest population was measured on the first date, dominated by an unidentified chrysophyte. The rest of the season was dominated by the chrysophyte *Dinobryon* for most of the sample season, which made peaks in August and September. Other species found in the lake included the chlorophyte *Botryococcus* and the dinoflagellate *Ceratium.* Chlorophyll content reflected the first peak in phytoplankton, but did not record the August and September peaks in *Dinobryon*. Phaeophytin (degraded chlorophyll) content was uniformly low.

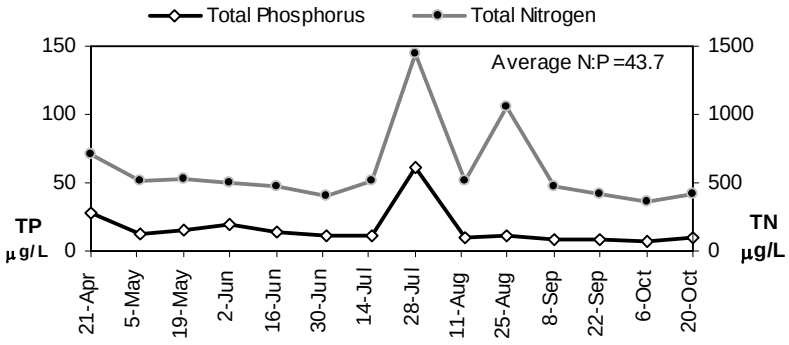


BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

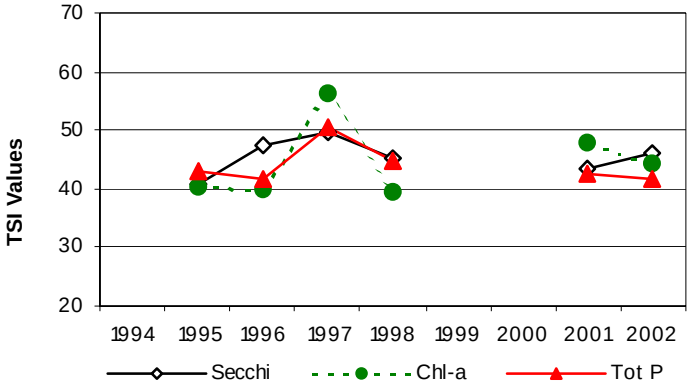


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period, aside from one exceptionally high nitrogen value that was not reflected in the phosphorus (see chart). The values of both nutrients were exceptionally high on July 28th, suggesting an unusual amount of organic material may have been incorporated into the sample. Aside from those dates, the N:P ratio ranged from 25 to 54.



In 2002 the average TSI values were relatively close together in the mid-range for mesotrophy, similar to 1998 and 2001.

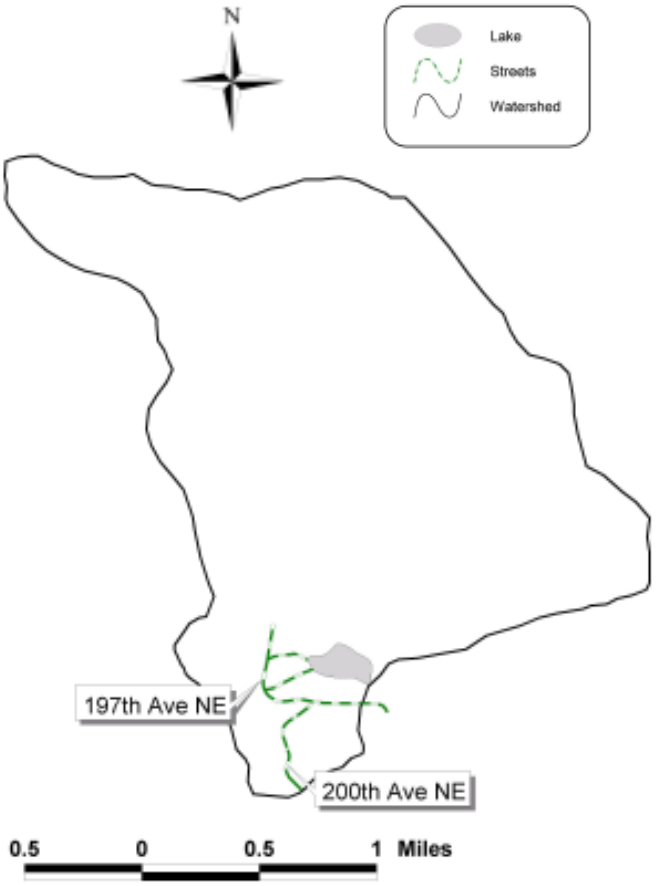


Overview

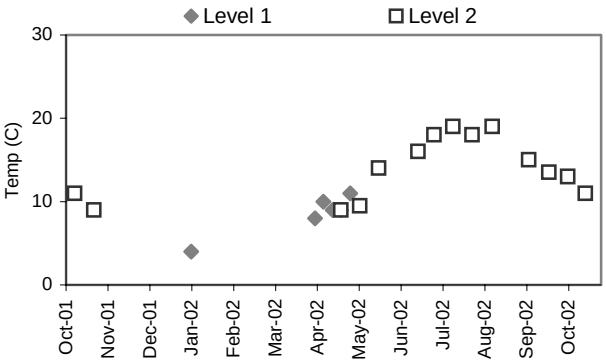
Volunteer monitoring began at Paradise Lake in 1996 and has continued through 2002. The data collected indicate this lake, whose watershed extends into Snohomish County, is high in primary productivity (eutrophic) with fair water quality. Since the lake surface makes up less than 1% of the drainage area, direct precipitation is not important; much more input comes surface flow and ground water. The lake shorelines are classified as Class II wetlands according to King County Wetland Inventory (King County 1990). Current land use is largely rural, agricultural, forested or open space, with several suburban developments in the southern catchment.

Paradise Lake has no public access boat launch, but residents should keep an eye out for early infestations of Eurasian milfoil, Brazilian elodea, and other noxious weeds.

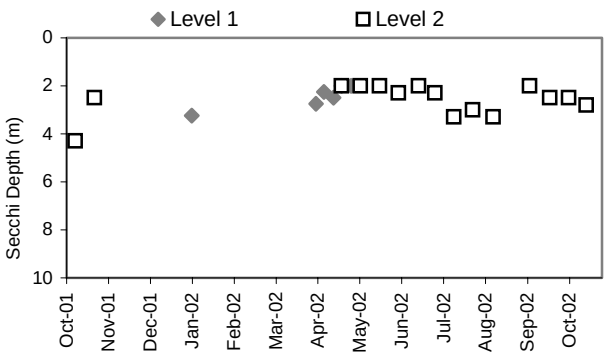
Watershed Map



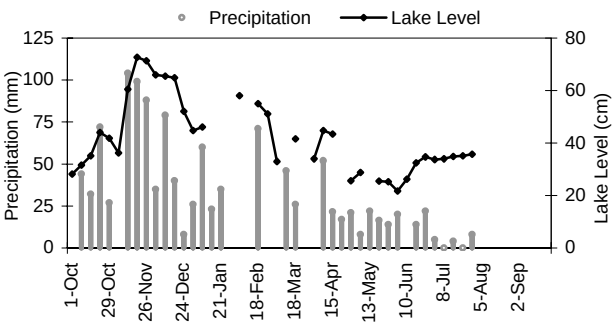
Lake Temperature



Secchi Depth



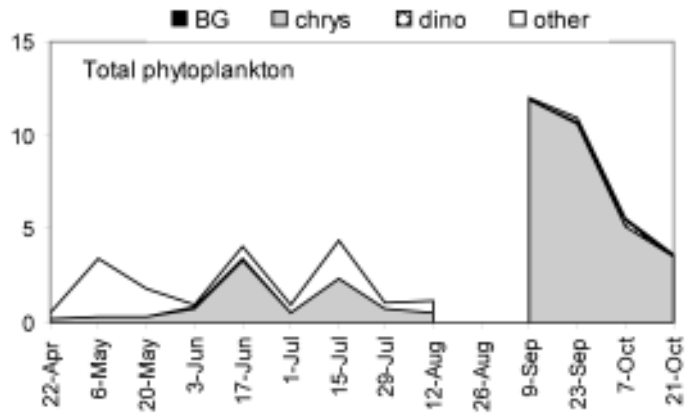
Lake Level and Precipitation



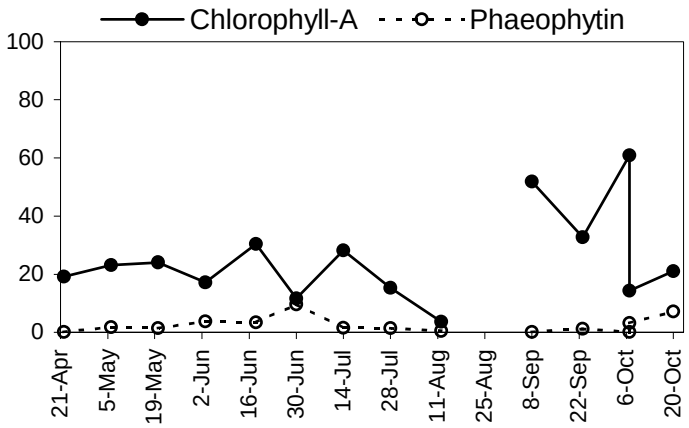
Secchi transparency ranged from 2.0 to 4.3m, with several gaps in the record. Water temperatures were recorded for the same interval as the Secchi. They ranged from 4 to 19 degrees Celsius. Water levels reached a peak in late November 2002 and generally declined slowly through the rest of the water year.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton population early in the sampling season was dominated by the cryptophyte *Rhodomonas*, followed by a combination of the chlorophyte *Asterococcus* and an unidentified chrysophyte. In early September, a large population of the chrysophyte *Dinobryon* and another unidentified species dominated the phytoplankton. Chlorophyll content generally reflected the pattern of the phytoplankton counts and recorded the big increase in biovolume in early fall. Phaeophytin (degraded chlorophyll) content remained very low except for June 30th, when there was apparently a fairly large amount in the sample.



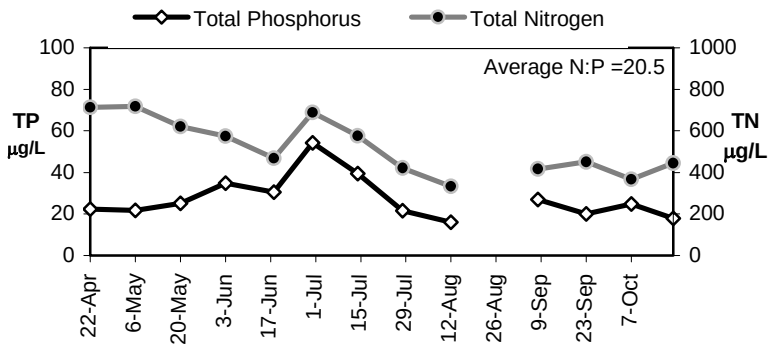
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

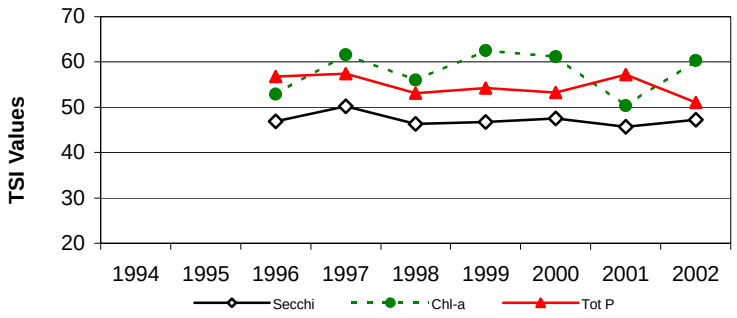


Nutrient Analysis and TSI Ratings

Total nitrogen decreased early in the season, after which nitrogen and phosphorus remained in fairly close proportion to each other. The N:P ratio ranged from 13 to 33.

In 2002 the TSI values for chlorophyll and TP indicated eutrophy, while the Secchi was in the mesotrophic range, similar to other years. The spread of the three indicators was most similar to 1998 and 1999.



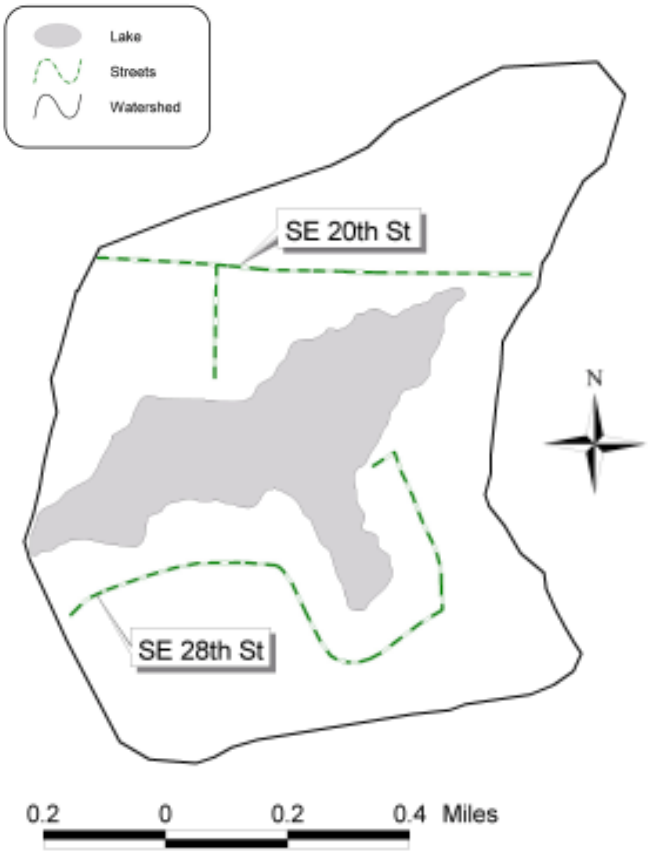


Overview

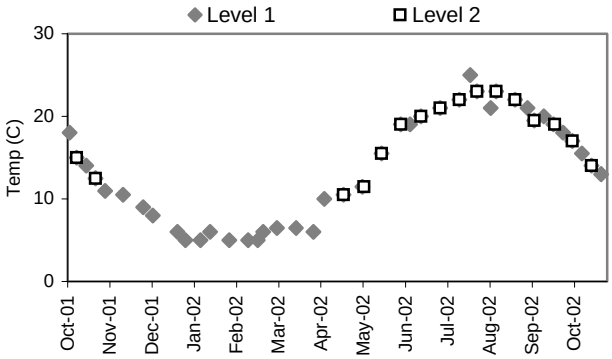
Volunteer monitoring began at Pine Lake in the 1980s and has continued through 2002, with a gap from 1990–1992 and in 1994. The data collected indicate this city lake (Sammamish) is currently low in primary productivity (high oligotrophic) with very good water quality. Diversion of wetland flow from the western catchment was completed in 1988 to decrease phosphorus input to the lake, which reduced the functional drainage area from 640 acres to 487. Since the lake surface makes up 18% of the current drainage area, direct precipitation is very important, in addition to surface flow and ground water. Current land use is largely suburban residential and open space, but includes portions of a shopping center.

Pine Lake has a public access boat launch, and residents should keep an eye out for early infestations of Eurasian milfoil, Brazilian elodea, and other noxious weeds.

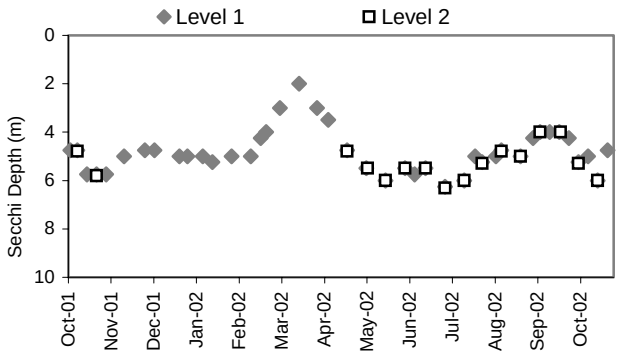
Watershed Map



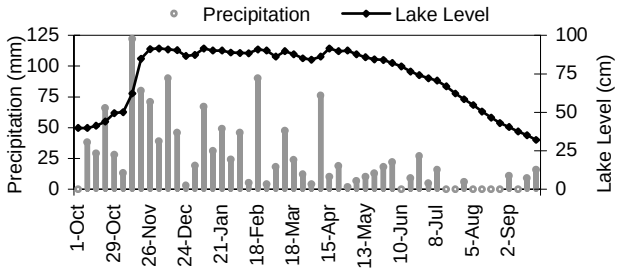
Lake Temperature



Secchi Depth



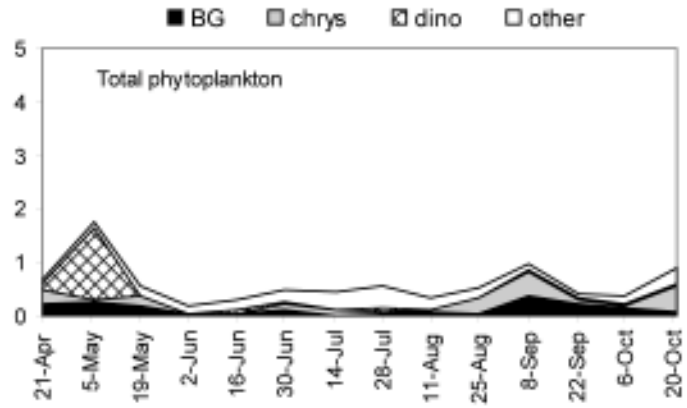
Lake Level and Precipitation



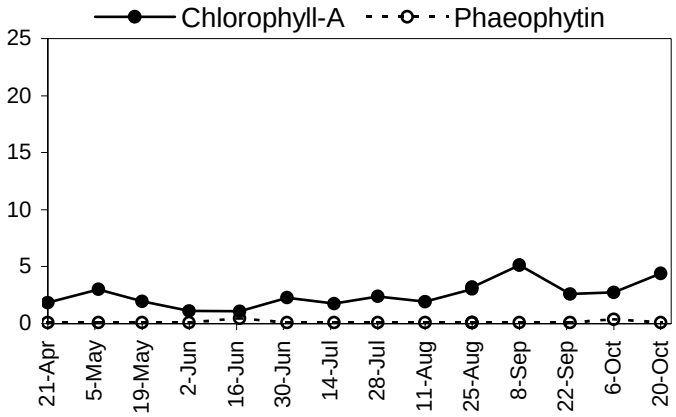
Secchi transparency ranged from 2.0 to 6.3m through the year, with a distinct minimum in March. Annual water temperatures ranged from 5.0 to 23.0 degrees Celsius. Water levels reached a plateau high level in December and began dropping in May. No records were available for summer through fall.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton population was low through the sampling period, with the maximum volume recorded on the second sample date. At that time, the dinoflagellate *Peridineum* dominated the community. Several species of chlorophyte algae became prominent in summer, followed by the chrysophyte *Dinobryon.* The bluegreen *Aphanizomenon* was present in small amounts throughout the period. Chlorophyll content did not record the peak in *Peridineum*, but reflected the pattern of the other phytoplankton counts. Phaeophytin (degraded chlorophyll) remained very low through the entire period.



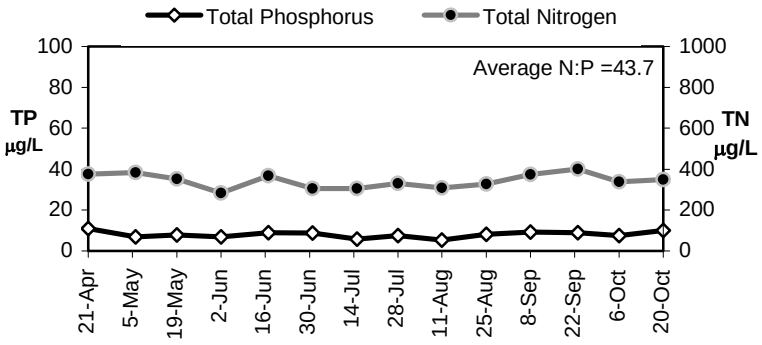
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

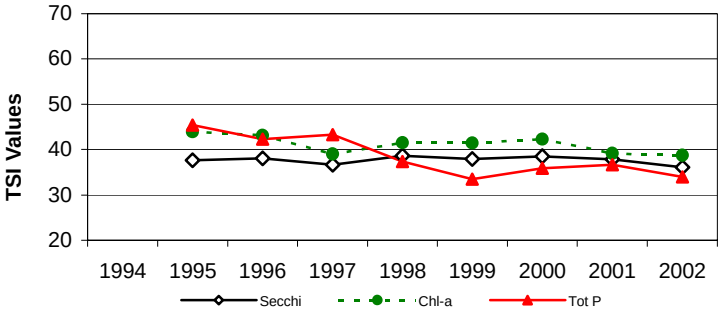


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in stable proportions to each other through the sampling period, with little change in values. The N:P ratio ranged from 35 to 57.

In 2002 the TSI values were close to each other at the high end of the oligotrophic range, similar to 1998 and 2001. In other years, the indicators have had a wider spread, but since 1998 their rank has remained the same with TSI-Chlor the highest and TSI-TP the lowest of the three.



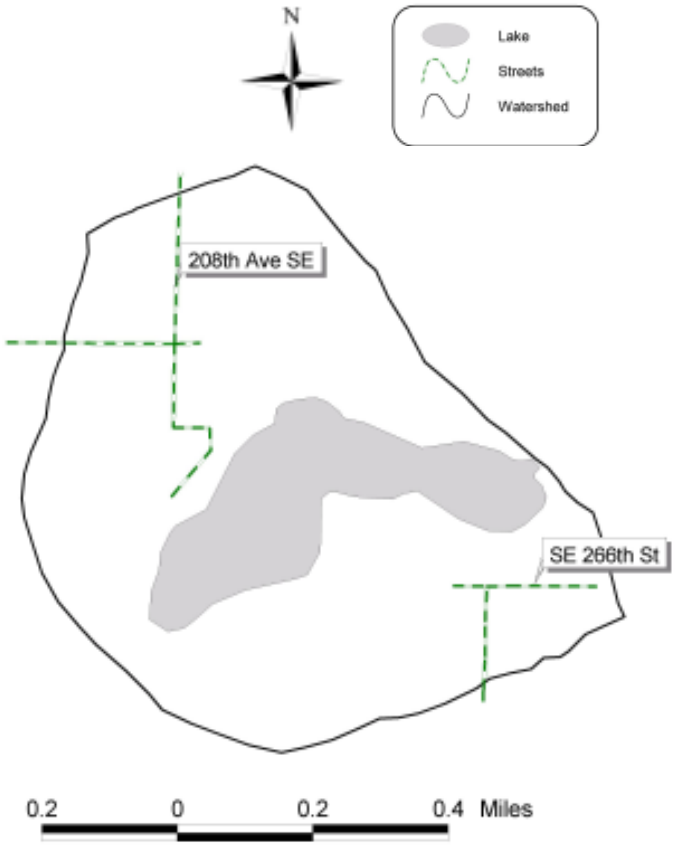


Overview

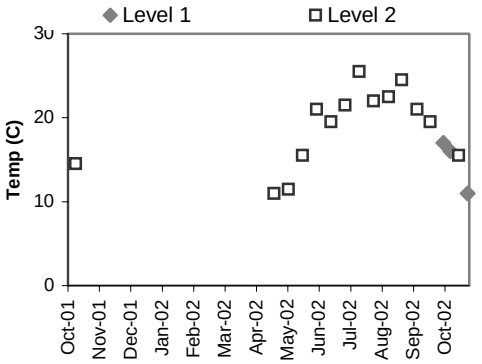
Volunteer monitoring began at Pipe Lake in the 1980s and has continued through 2002, with a gap from 1989–1992. The data collected indicate this city lake (Maple Valley–Covington) is currently low to moderate in primary productivity (oligotrophic to mesotrophic) with very good water quality. Since the lake surface makes up 17% of the drainage area, direct precipitation is important in addition to surface flow and ground water. While some of the lake shoreline is classified as wetland, there is only one Class 4 wetland in the catchment (King County 1990). Current land use is largely residential and open space.

Pipe Lake has no public access boat launch, but has a history of both milfoil and *Hydrilla* infestations for which eradication efforts have been funded by Washington State Dept of Ecology and the cities since 1995. Residents should watch aquatic plants growing nearshore to catch growing patches of these and other noxious weeds.

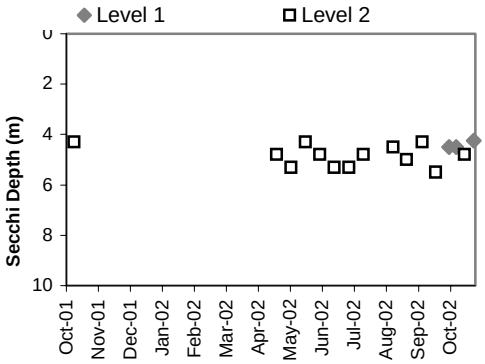
Watershed Map



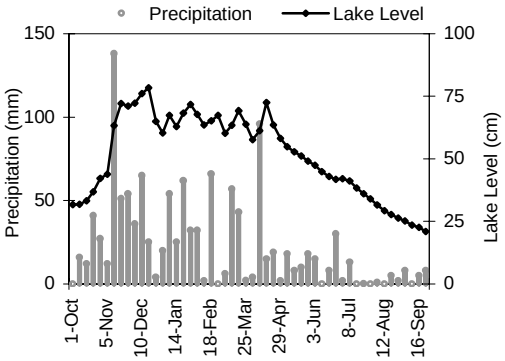
Lake Temperature



Secchi Depth



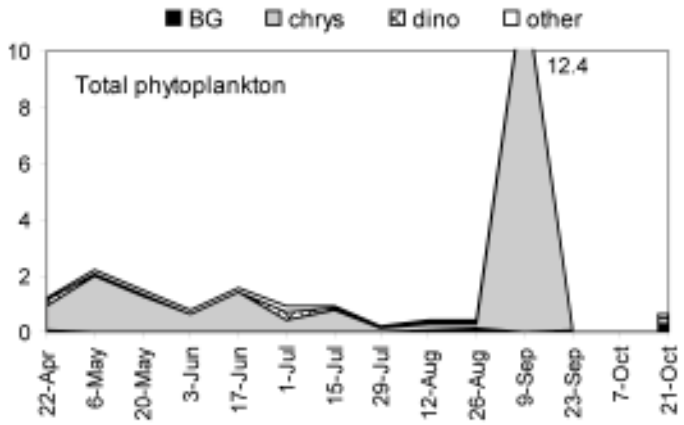
Lake Level and Precipitation



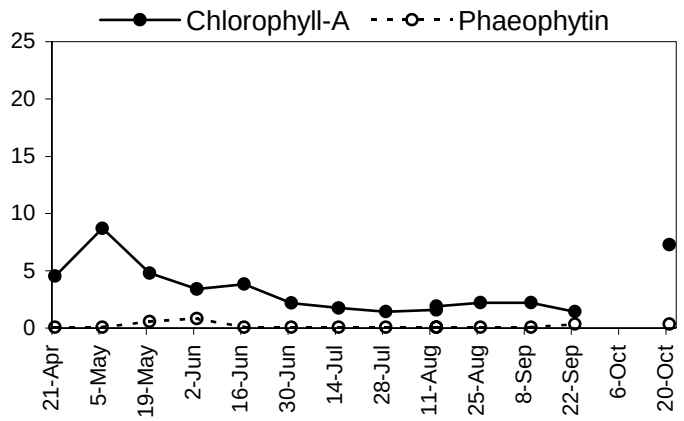
Secchi transparency during the months of April through October ranged from 4.3 to 5.5m. Water temperatures for the same period ranged from 11 to 25.5 degrees Celsius. Excellent precipitation and water level records recorded a high-stand in winter dropping to a low in autumn, typical of many area lakes.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton population remained at low levels through most of the sampling season, with the exception of one very high value on September 9th. The diatoms *Cyclotella* and *Tabellaria* were common early in the year, replaced by the chrysophyte *Dinobryon*, which made up the large September peak. The bluegreen *Anabaena* became prominent in the last sample of the year. Chlorophyll content did not record the large peak of *Dinobryon* in September, making that maximum somewhat problematic. Phaeophytin (degraded chlorophyll) remained very low in all samples.

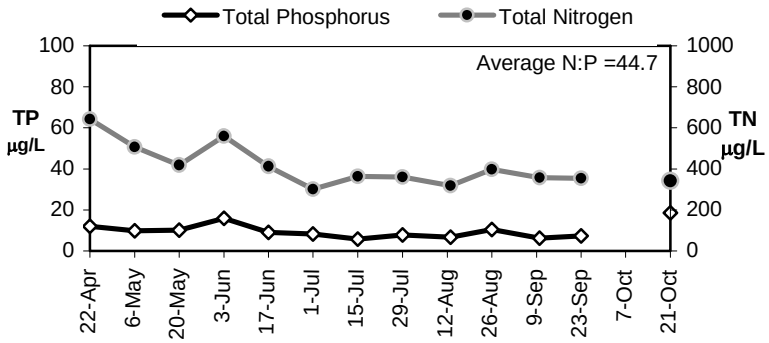


BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

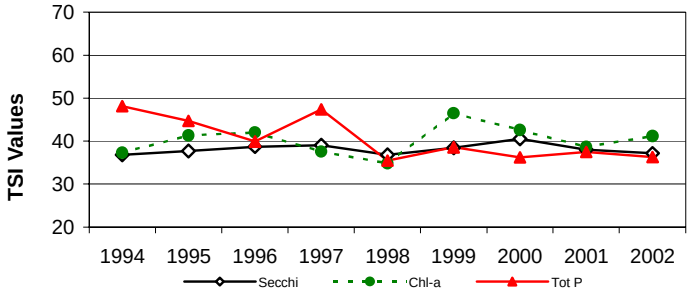


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period. The N:P ratio ranged from 18 to 63, with the ratio of 18 on the last sample date, when *Anabaena* was present.



In 2002 the TSI values were fairly close to each other at the high end of the oligotrophic range. This is similar to 2001, with the exception that TSI-Chlor is slightly higher in 2002. In many other years, the indicators have not been in close agreement with each other, but have not had a distinct pattern to the divergence.

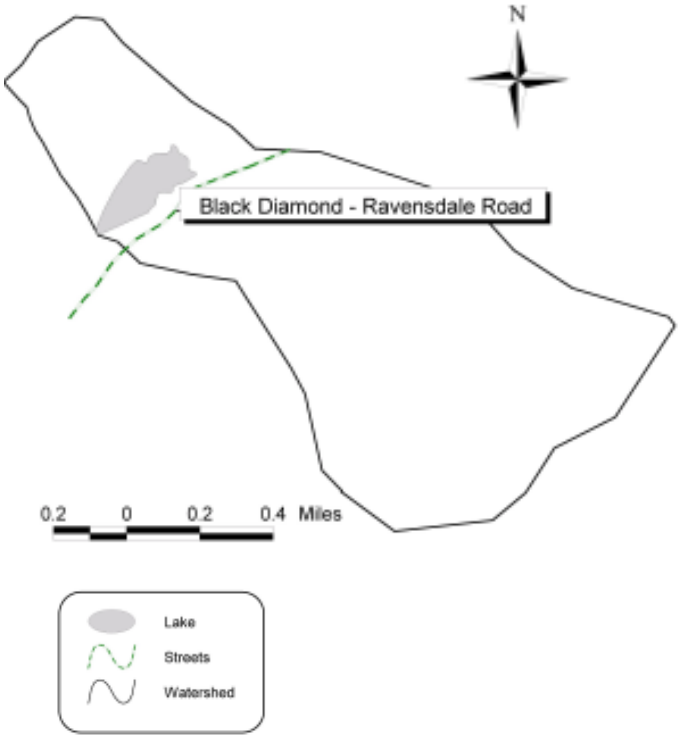


Overview

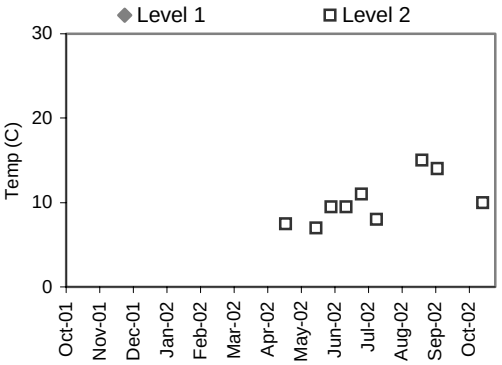
Volunteers monitored Ravensdale Lake from 1996 – 1998, and again in 2002. The data collected suggest that this lake is relatively low in primary productivity (oligotrophic to mesotrophic) with very good water quality. The King County Wetlands inventory identified one Class I (C) and two Class II wetlands in the watershed. The shoreline of the lake is part of a Class II wetland system (King County 1990). Current land use is largely rural and forested, with an industrial site on the southern shoreline.

Ravensdale Lake has no public access boat launch. Lake users should keep a close eye on aquatic plants growing nearshore to catch infestations of Eurasian milfoil, Brazilian elodea or other aquatic noxious weeds.

Watershed Map



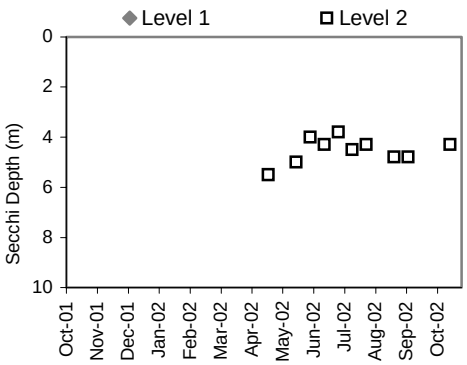
Lake Temperature



Lake Level and Precipitation

No Data Available

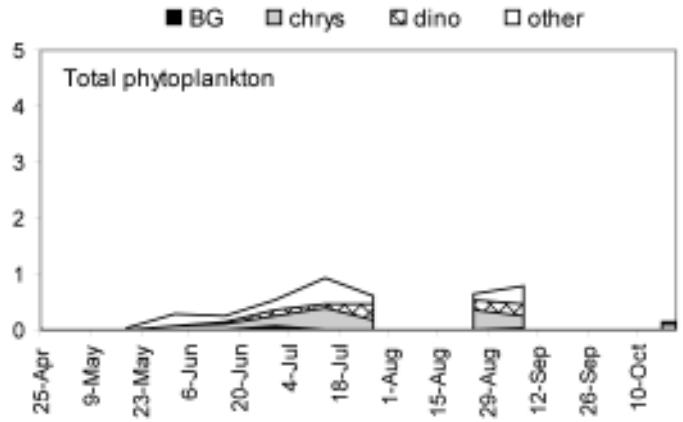
Secchi Depth



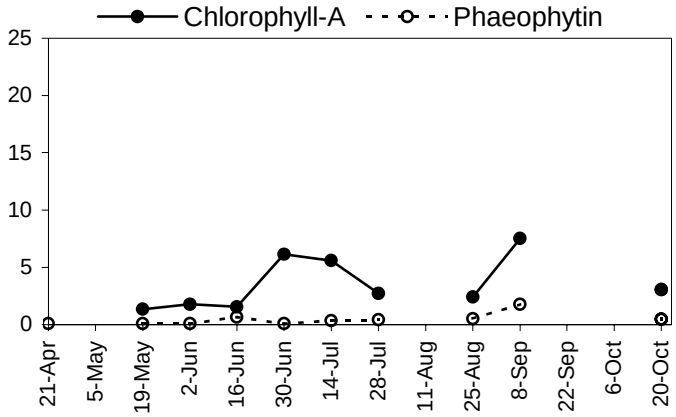
Secchi transparency was collected from April through October and ranged between 3.8 and 5.5m through the sample season. Surface water temperatures ranged between 7.0 and 15.0 degrees Celsius for the same time period. There were no precipitation or water level records.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton populations remained low, dominated by the chrysophyte *Dinobryon*, several cryptomonads, and the dinoflagellate *Peridineum*. Chlorophyll content generally followed the phytoplankton volumes through the sample season. Phaeophytin (degraded chlorophyll) remained very low except for one date, September 8th, when it rose slightly.



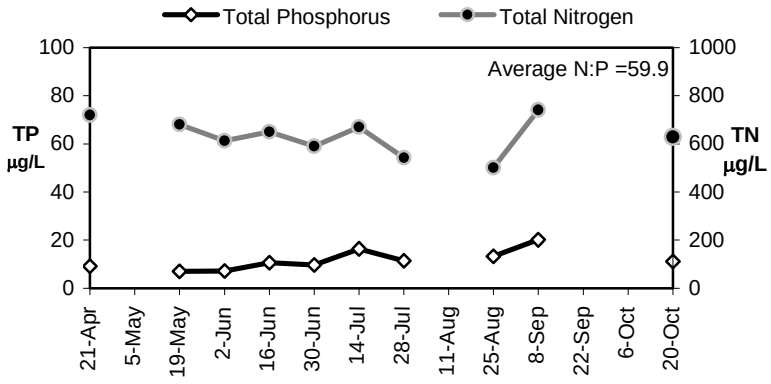
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

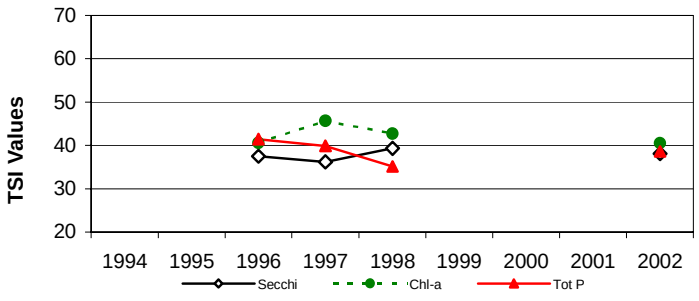


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen appeared to fluctuate through the sampling period, although the N:P ratio ranged from 37 to 96.

In 2002 the three average TSI values were very close together on the threshold between oligotrophy and mesotrophy, much like 1996. The TSI indicator values were spread apart in 1997 and 1998.



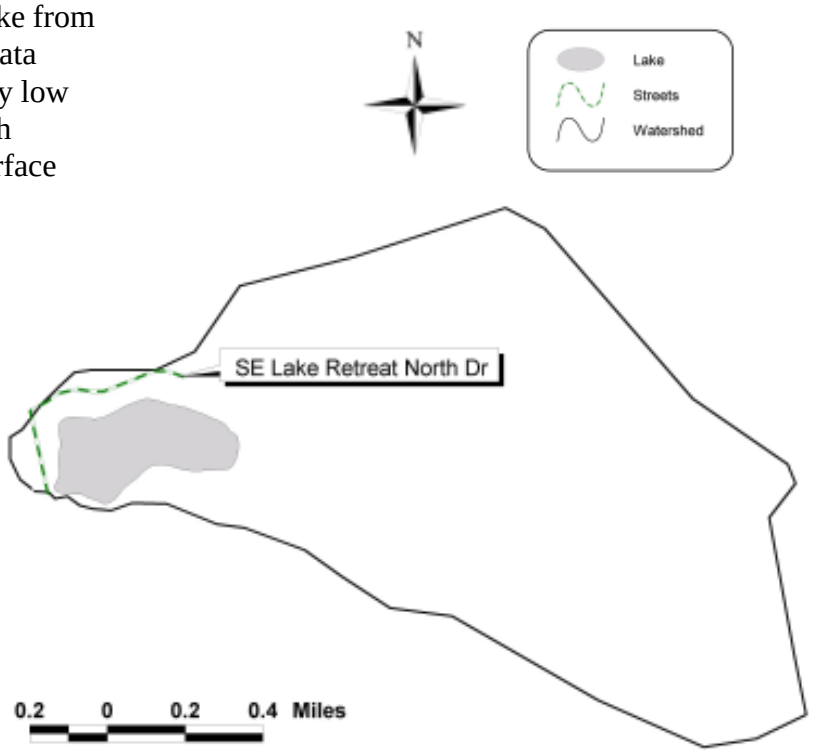


Overview

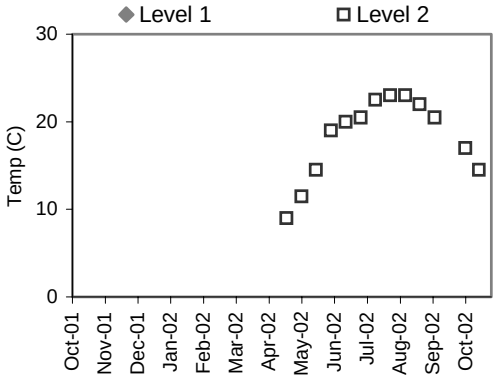
Volunteer monitoring began at Retreat Lake from 1996 to 2002 with a hiatus in 2001. The data collected suggest that this lake is relatively low in primary productivity (oligotrophic) with excellent water quality. Since the lake surface makes up 3% of the drainage area, direct precipitation is not as important as surface and ground water inputs. There is only one Class 4 wetland in the basin. (King County 1990). Current land use is largely rural open space, with a fringe of suburban homes around the shoreline, but some areas of the may be under development.

Retreat lake has no public access boat launch, but residents should keep a close eye on aquatic plants growing nearshore to infestations of Eurasian milfoil, Brazilian elodea or other aquatic noxious weeds.

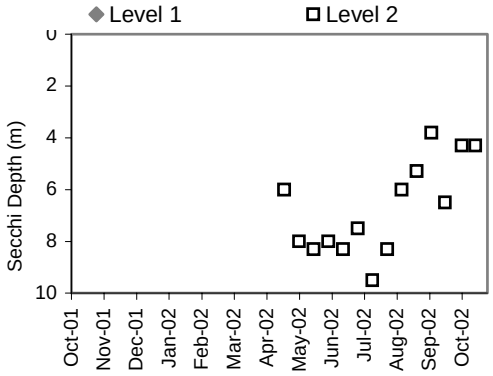
Watershed Map



Lake Temperature



Secchi Depth



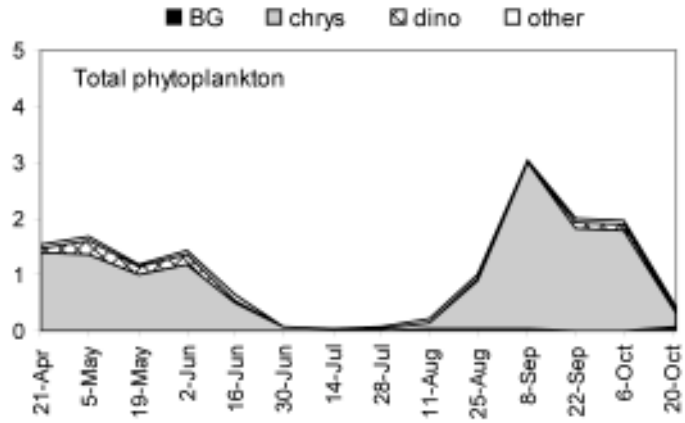
Lake Level and Precipitation

No Data Available

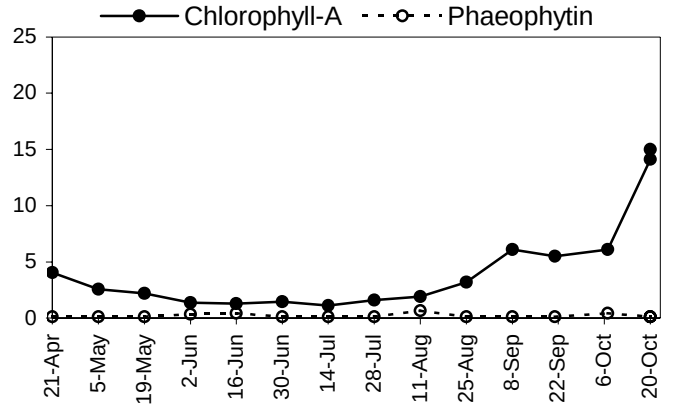
Secchi transparency ranged between 3.8 and 9.5m between April and October, with lower water clarity late in the sampling season. Surface water temperatures ranged between 9.0 and 23.0 degrees Celsius during the same time period. Precipitation and water level data recorded a maximum stand in early December, and levels began to decrease in May, reaching a low stand at the end of the water year.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton populations were small to moderate, dominated by the diatoms *Cyclotella* and *Fragilaria*, mixed with the dinoflagellate *Peridineum* and the chrysophytes *Gloeobotrys* and *Dinobryon*. There were distinct periods of abundance at the beginning and end of the sample season. Chlorophyll content recorded the later maximum more faithfully than the early period. Phaeophytin (degraded chlorophyll) remained low throughout the period.



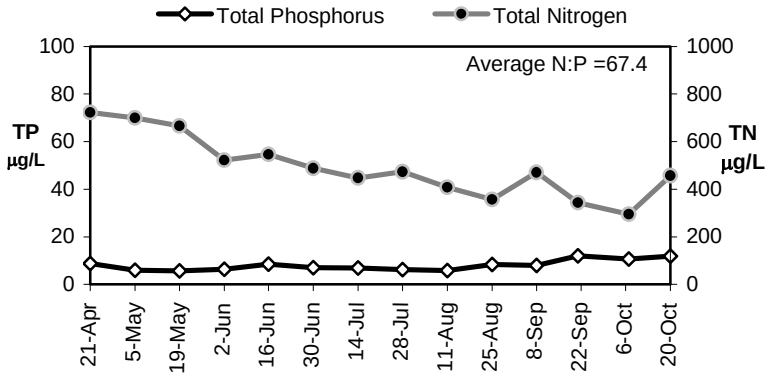
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

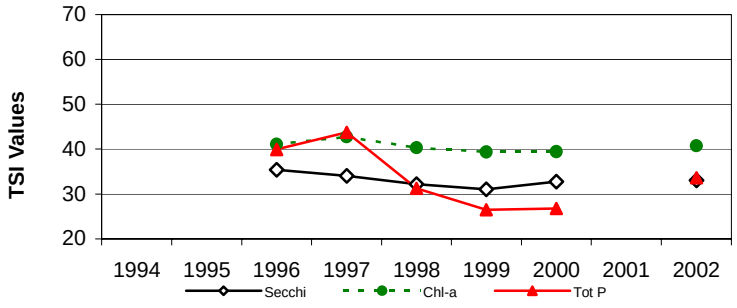


Nutrient Analysis and TSI Ratings

Total nitrogen decreased slowly through the season from a maximum on the first sample date, while total phosphorus remained fairly steady. The N:P ratio ranged from 28 to 118.

In 2002 the average TSI-chlor was higher than the other two average TSI values, which agreed with each other in the lower third of the oligotrophic range. TSI-chlor has been consistently higher than the other indicators since 1998.



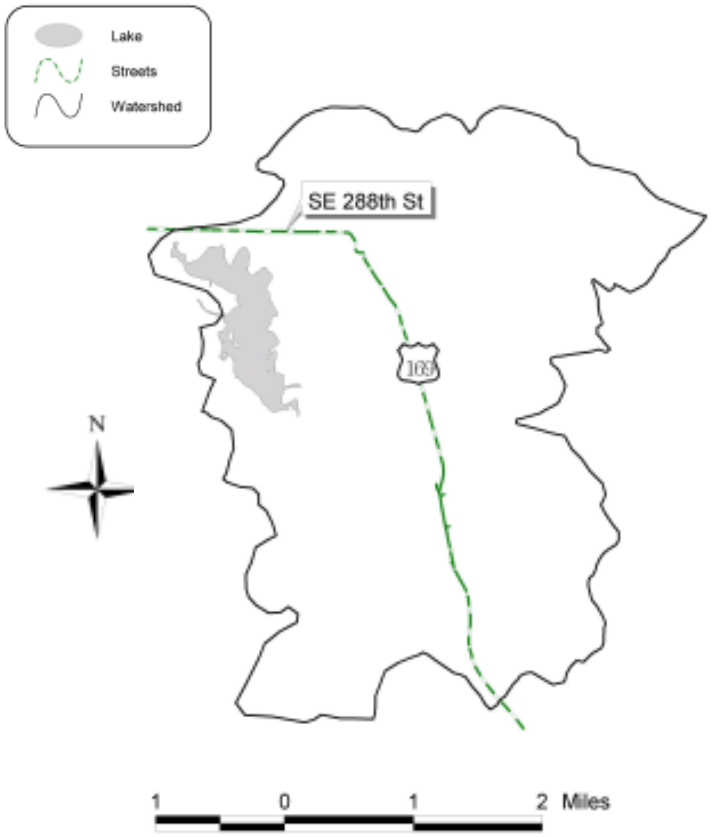


Overview

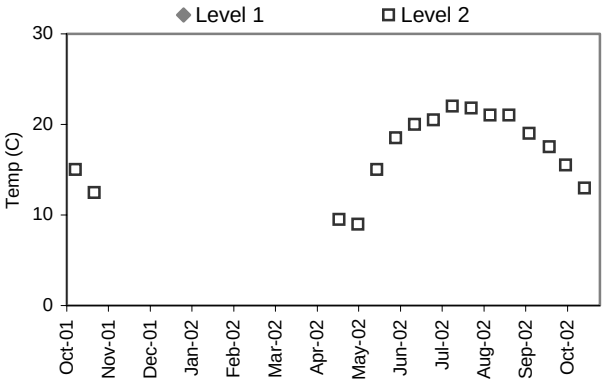
Volunteer monitoring began at Lake Sawyer in the 1980s, continuing through 2002. The data collected indicate this city lake (Black Diamond) is low to moderate in primary productivity (oligotrophic to mesotrophic) with very good water quality. Since the lake surface makes up only 3% of the drainage area, direct precipitation is much less important than surface and groundwater inputs. There are five Class I and nine Class 2 wetlands in the watershed (King County 1990). Current land use is complex, with three jurisdictions within the catchment. Use ranges from urban and commercial to rural, forested, agricultural and open space. A Lake Management Plan was published, but not implemented (King County 2000).

Lake Sawyer has a popular public access boat launch and supports a Eurasian milfoil infestation that might respond to management activities. Residents should keep a close eye on aquatic plants growing nearshore to catch growing patches of this, Brazilian elodea, and other noxious weeds.

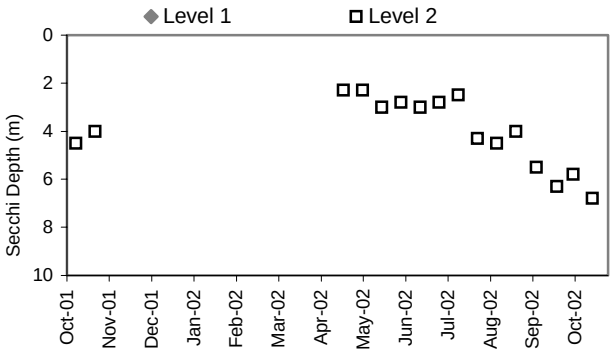
Watershed Map



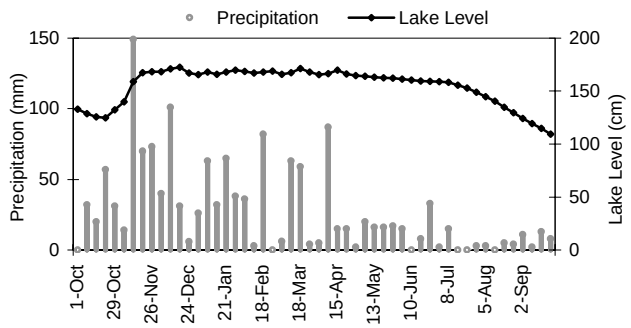
Lake Temperature



Secchi Depth



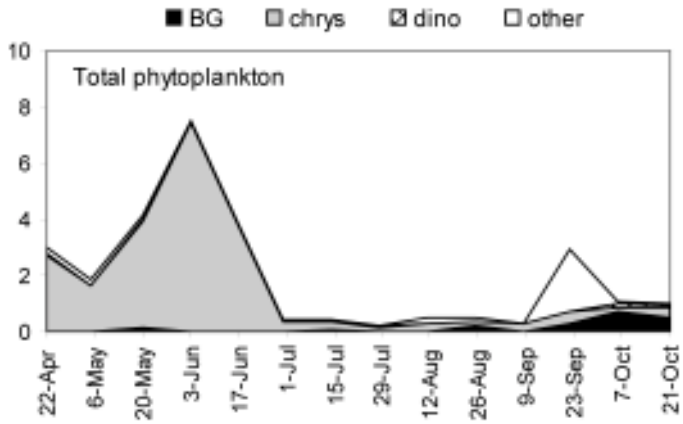
Lake Level and Precipitation



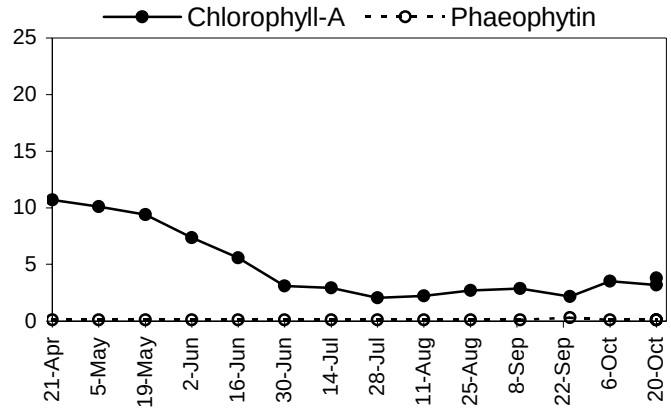
Secchi transparency ranged from 2.3 to 6.8m during April through October. Water temperatures during the same period ranged from 9.0 to 22.0 degrees Celsius. Water levels rose in December and remained high until late August, producing a slightly different pattern than many lakes in the region.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton population made one major peak in early June, dominated by the diatom *Cyclotella* with a smaller amount of the chrysophyte *Dinobryon*. The chlorophyte *Botryococcus* became abundant in September and, by October, the bluegreen *Lyngbya* increased in prominence. Chlorophyll content mirrored the pattern of the phytoplankton counts only in a general way, reflecting the higher values found in spring. Phaeophytin (degraded chlorophyll) remained very low through the entire period.



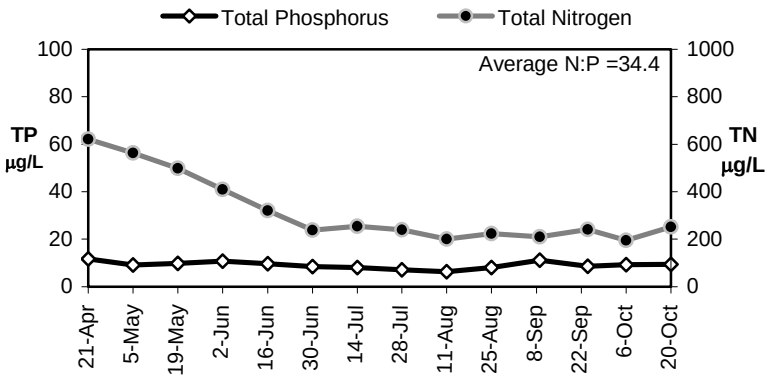
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

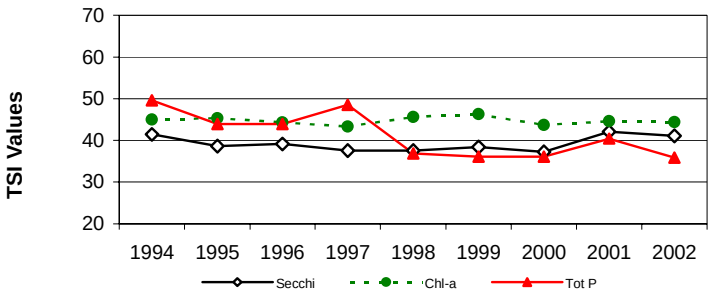


Nutrient Analysis and TSI Ratings

Total nitrogen decreased over spring and then remained constant relative to total phosphorus through the remaining sampling period. The N:P ratio ranged from 19 to 61, with the lower values in fall when the bluegreen *Lyngbya* was present.

In 2002 the average TSI values were spread across the threshold between oligotrophy and mesotrophy. TSI-TP was lower than the other two average values, but in general they appeared to be similar to values obtained in 2001.





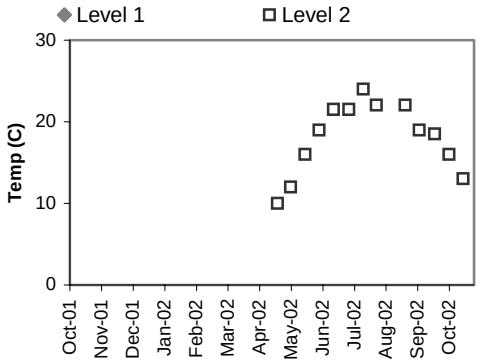
Overview

Volunteer monitoring began at Shadow Lake in the 1980s and has continued through 2002, with two gaps over time. The data collected indicate this lake is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 12% of the drainage area, direct precipitation is less important than surface and ground water inputs. There is one large Class I (D) wetland in the watershed adjacent to the lake, from which a creek leaves the basin (King County 1990). Other parts of the shoreline are also classified as wetland. Current land use is largely rural, with suburban housing concentrated north and along the shoreline of the lake.

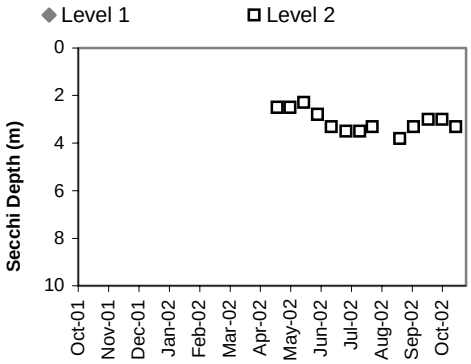
Shadow Lake has a public access boat launch. Eurasian milfoil has been found in the lake since 1995, but does not appear to be increasing. Residents should keep an eye on aquatic plants growing nearshore to catch any increases in patches of this, Brazilian elodea, and other noxious weeds.

Watershed Map

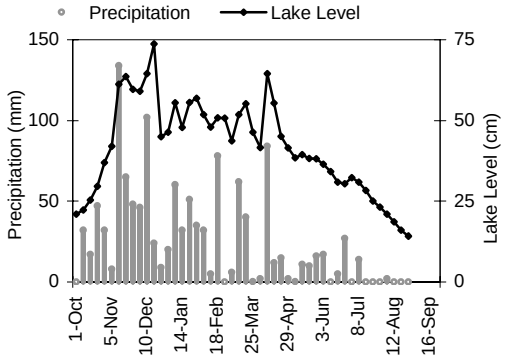
Lake Temperature



Secchi Depth



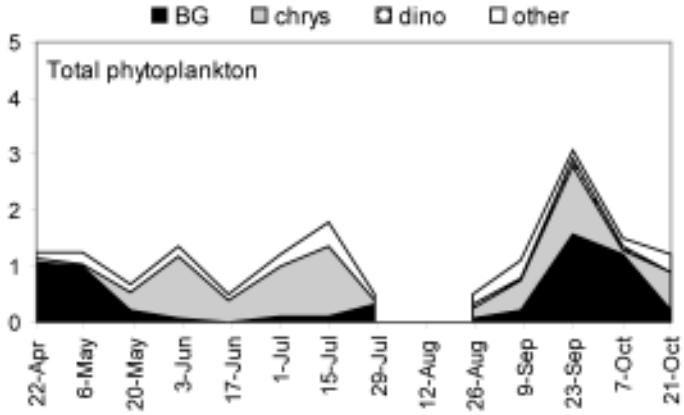
Lake Level and Precipitation



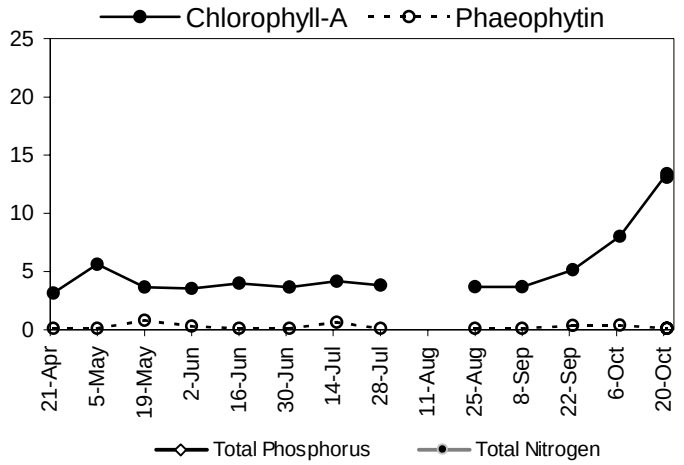
Secchi transparency ranged from 2.3 to 3.8m during April through October. Water temperatures ranged from 10.0 to 24.0 degrees Celsius during the same period. Water level and precipitation records were mostly complete, showing the winter-high, summer-low pattern typical of lakes in the region.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Although phytoplankton populations were low to moderate through the sampling season, the beginning and end of the period was marked by the prominence of the bluegreen *Aphanizomenon*. In June the diatom *Tabellaria* became dominant, followed by the chrysophyte *Dinobryon*. Chlorophyll content generally followed the phytoplankton biovolume, but continued to climb in value through the fall, unlike the decline in phytoplankton in October. Phaeophytin (degraded chlorophyll) remained at very low levels through the sample season.



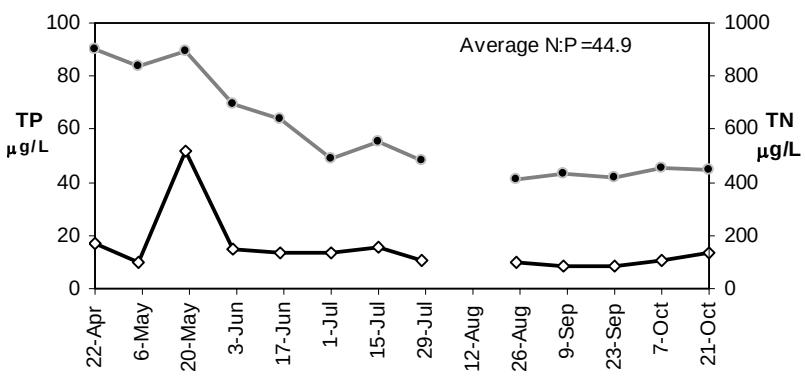
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

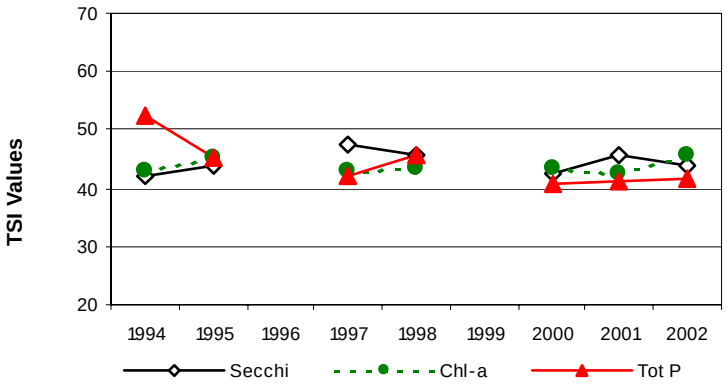


Nutrient Analysis and TSI Ratings

Total nitrogen decreased early in the season and then remain in relatively constant proportion to total phosphorus, with the exception of one very high phosphorus value (see chart). Aside from that date, the N:P ratio ranged from 34 to 87.

In 2002 the average TSI values were close together in the low to midrange of mesotrophy, similar to recent years.





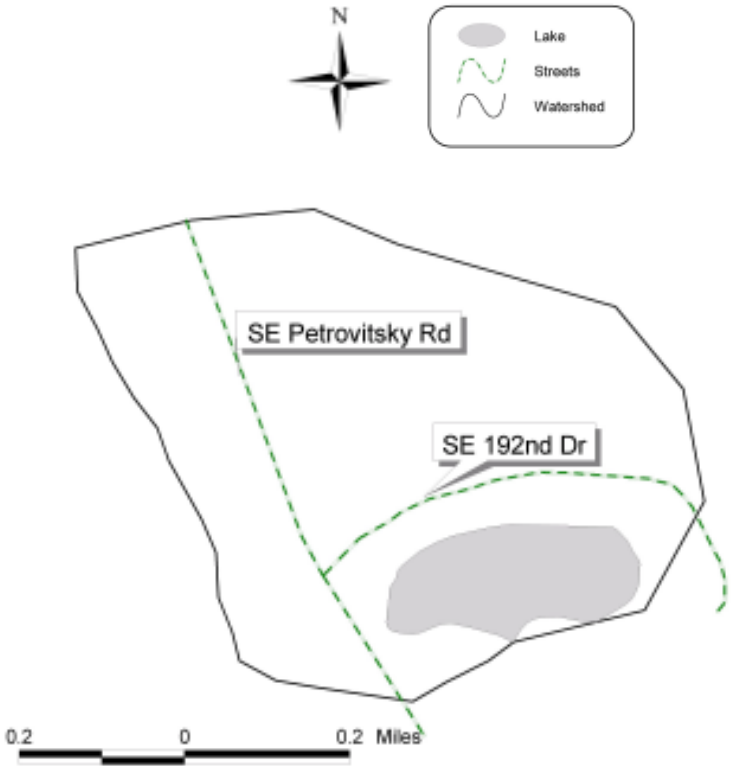
Shady

Overview

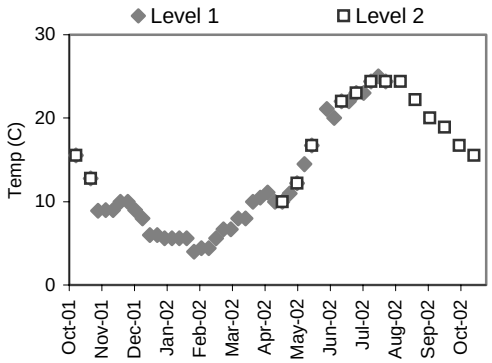
Volunteer monitoring began at Shady Lake in the 1980s and has continued through 2002, with no gaps. The data collected indicate this lake is low to moderate in primary productivity (oligotrophic to mesotrophic) with very good water quality. Since the lake surface makes up about 10% of the drainage area, direct precipitation is less important than surface and ground water inputs. There were no wetlands inventoried in the watershed other than along the shoreline of the lake (King County 1990). Current land use is largely rural to suburban, with residences surrounding the lake and a housing development straddling the northern boundary of the catchment.

Shady Lake has a public access boat launch, and sparse patches of Eurasian milfoil were found in 2001. Nuisance populations of a hybrid *Potamogeton* (pondweed) have also been reported. Residents should keep a close eye on aquatic plants growing nearshore to catch any increases in the patches of these, Brazilian elodea, or other aquatic noxious weeds.

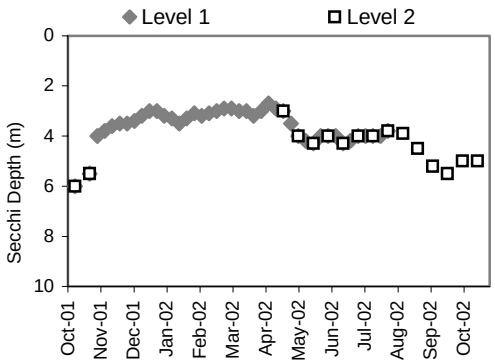
Watershed Map



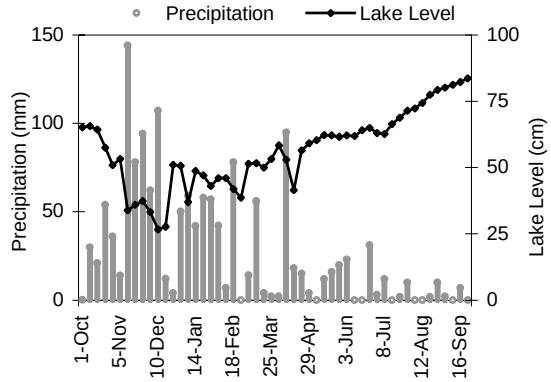
Lake Temperature



Secchi Depth



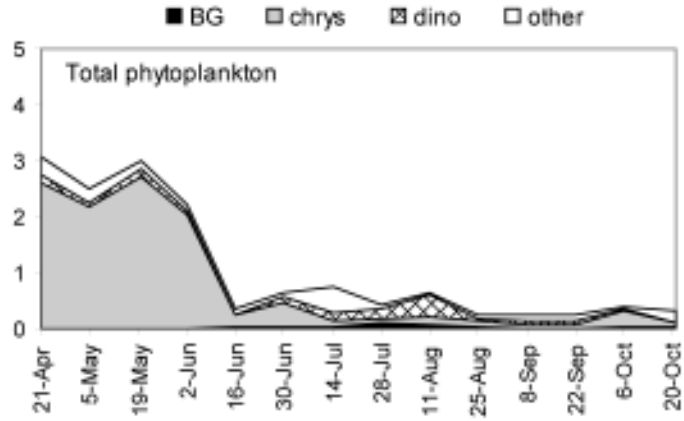
Lake Level and Precipitation



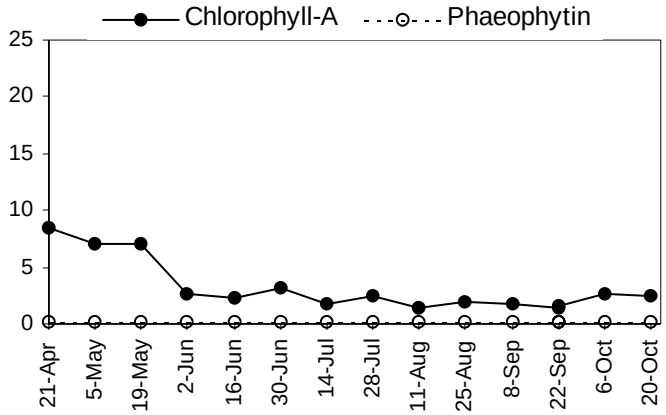
Secchi transparency ranged from 2.7 to 6.0 through the year. Annual surface water temperatures ranged from 4.0 to 25.0 degrees Celsius. Excellent precipitation and water level records were kept, showing that the lake level responded slowly to precipitation, with higher stands in the winter, decreasing slowly over the spring and summer to a minimum in the fall.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Maximum phytoplankton volumes were found in early in the sampling season, dominated by the diatom *Cyclotella* until mid-June. During summer through fall, a variety of species occurred in low abundance, including the dinoflagellate *Peridineum*, the chlorophyte *Botryococcus*, and the chrysophytes *Gloeobotrys* and *Dinobryon*. Chlorophyll content reflected the phytoplankton populations closely, while phaeophytin (degraded chlorophyll) remained very low for all sample dates.



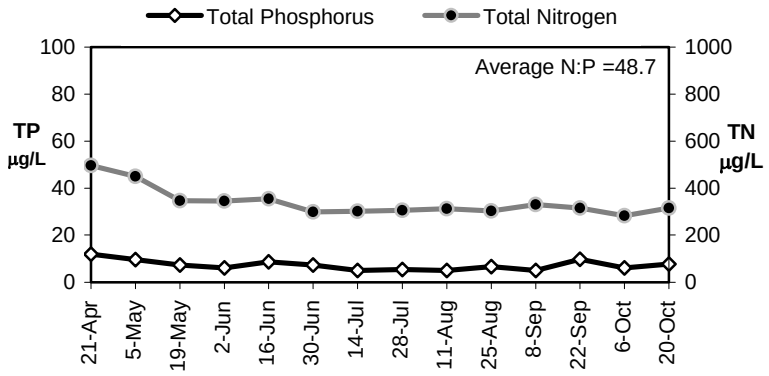
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

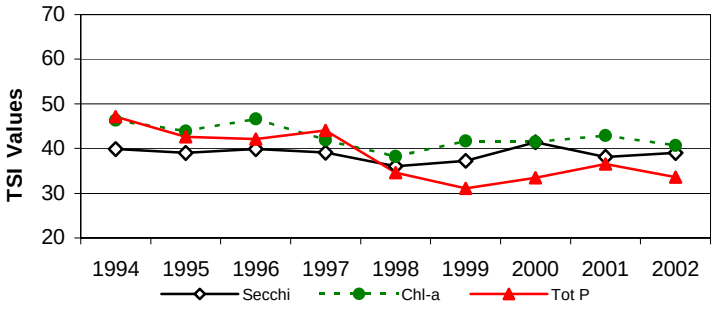


Nutrient Analysis and TSI Ratings

Total nitrogen decreased slightly over the first three dates and then remained in fairly constant proportion to total phosphorus through the remaining sampling period. The N:P ratio ranged from 32 to 66.

In 2002 the averages for TSI-Chlor and TSI-Secchi were on the borderline between oligotrophy and mesotrophy, while the TSI-TP substantially lower. TSI-TP has been consistently lower than the other indicators for five successive years.



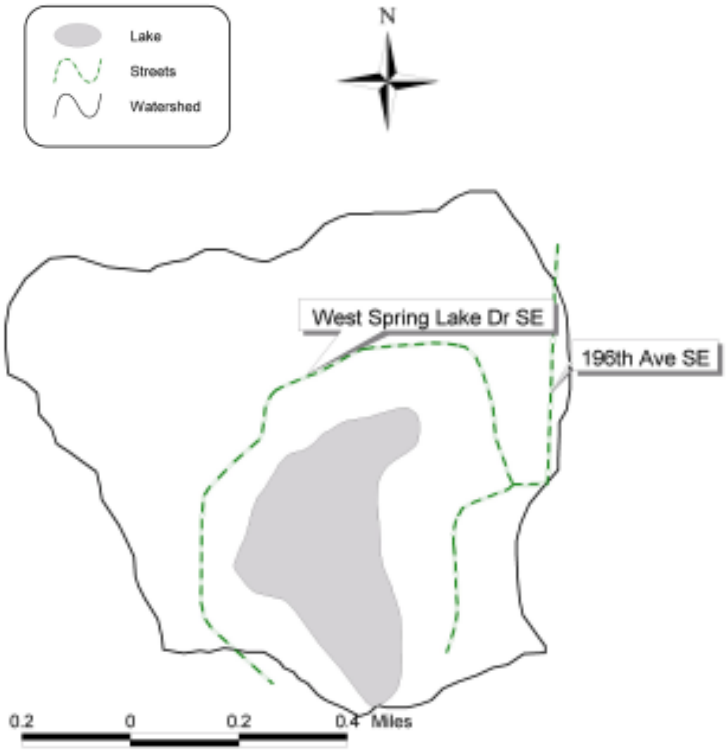


Overview

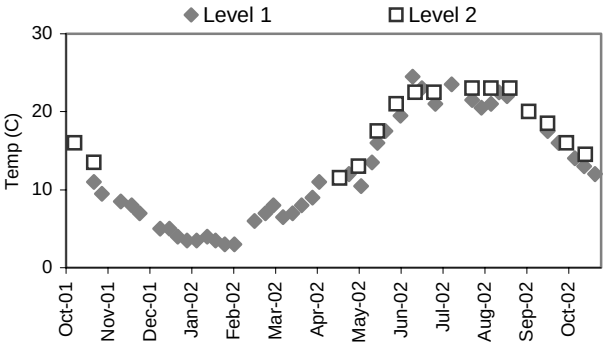
Volunteer monitoring began at Spring Lake in the 1980s and has continued through 2002, with the exception of 1995. The data collected indicate this lake is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 15% of the drainage area, direct precipitation is fairly important, in addition to surface and ground water inputs. There is one large, Class I wetland adjacent to the lake (King County 1990). Current land use is largely rural and undeveloped, with suburban housing around a majority of the lake shoreline and a large county park to the west.

Spring Lake has a public access boat launch, and a moderate infestation of Eurasian milfoil was found in 2001. Residents should keep a close eye on aquatic plants growing nearshore to catch any increases in the patches of this, or new infestations of Brazilian elodea, as well as other aquatic noxious weeds.

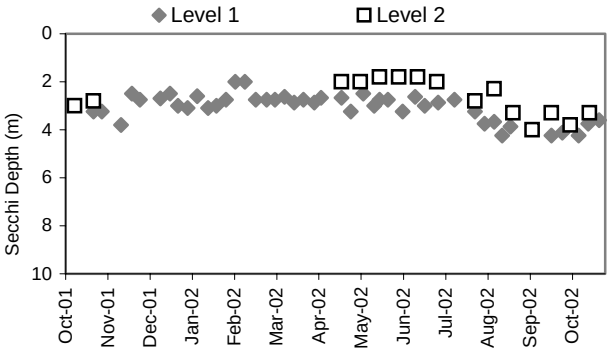
Watershed Map



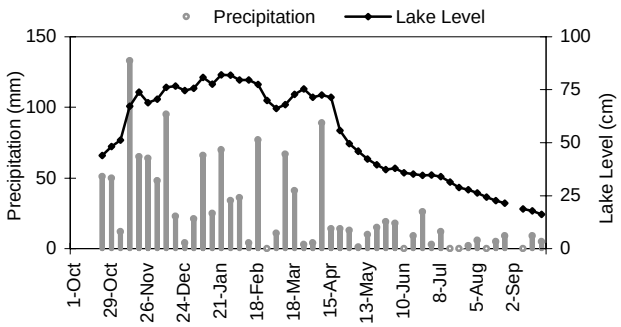
Lake Temperature



Secchi Depth



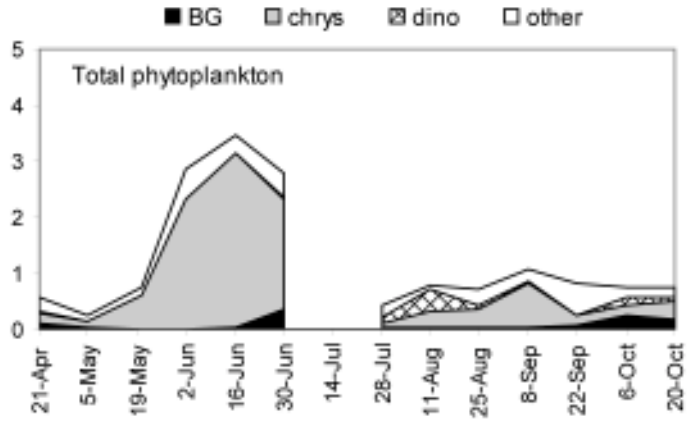
Lake Level and Precipitation



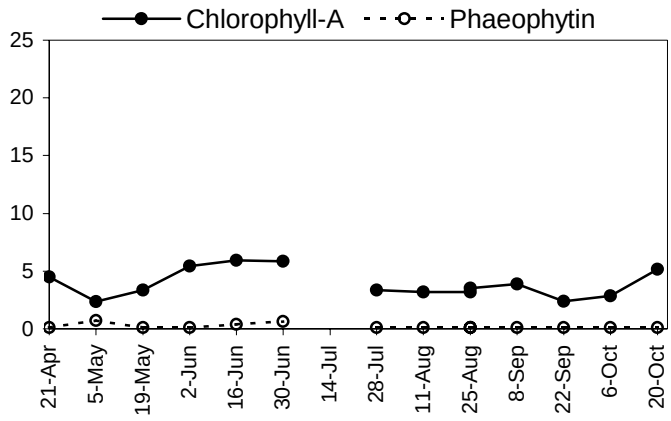
Secchi transparency ranged from 2.0 to 4.3m through the year. Water temperatures ranged from 3.0 to 24.5 degrees Celsius during the same period. Precipitation and water level records were essentially complete and showed that water levels follow the typical pattern of winter-high stands dropping to fall low-stands. Beaver activities have been found on the outlet stream, which may impact water levels in the future.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Maximum phytoplankton volumes were achieved in June, dominated by the diatom *Cyclotella* and the chrysophyte *Dinobryon*. Populations remained low to moderate through the rest of the sample period, with a variety of species present, including the dinoflagellate *Peridineum*, the chlorophyte *Botryococcus*, and the bluegreen *Aphanizomenon.* Chlorophyll content generally reflected the phytoplankton populations, but didn't show the magnitude of the spring maximum. Phaeophytin (degraded chlorophyll) remained very low through the sampling period.



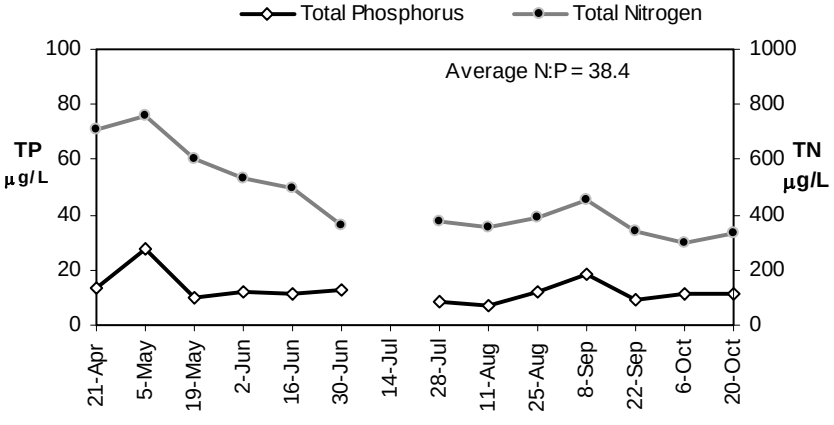
BG = Bluegreen; **chrys** = Chrysophytes;
dino = Dinoflagellates

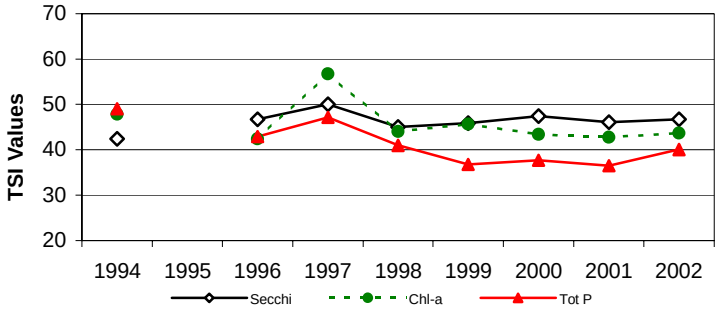


Nutrient Analysis and TSI Ratings

Total nitrogen decreased slowly until late June, after which it remained in stable proportion to phosphorus, which was fairly stable with the exception of one higher value in May. The N:P ratio ranged from 24 to 61, with the lower values occurring in the fall.

In 2002 the average TSI values for both Secchi and chlorophyll were in the mesotrophic range, while TSI-TP was near the boundary between mesotrophy and oligotrophy similar to the situation in the four previous years. Total phosphorus has given a lower trophic estimate than the other indicators for the past six years.



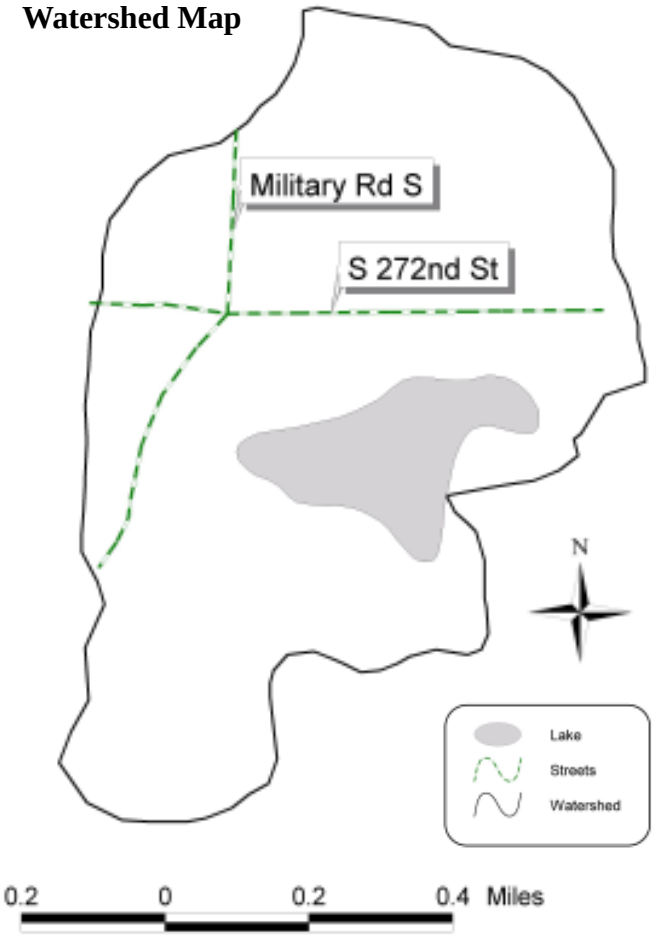


Overview

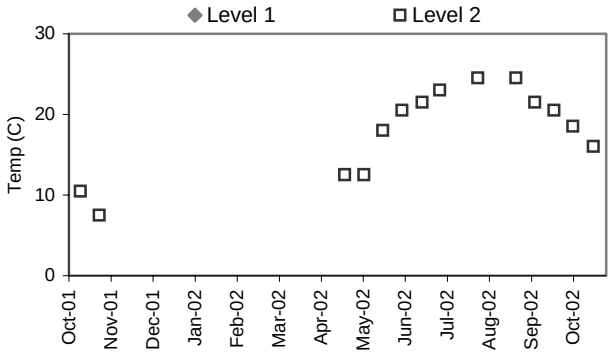
Volunteer monitoring began at Star Lake in the 1980s and has continued through 2002, with gaps in 1992 and 1994. The data collected indicate this lake is relatively low in primary productivity (oligotrophic, bordering on mesotrophic) with excellent water quality. Since the lake surface makes up 9% of the drainage area, direct precipitation is less important than surface and ground water inputs. There is one Class II wetland in the southern part of the watershed (King County 1990). Current land use is largely urban residential, with a freeway, school property, and small amounts of open space included in the catchment.

Star Lake has a public access boat launch, and the lake has been recently treated for a Eurasian milfoil infestation. Residents should monitor aquatic plants growing nearshore to catch any remnant patches of this, Brazilian elodea or other aquatic noxious weeds.

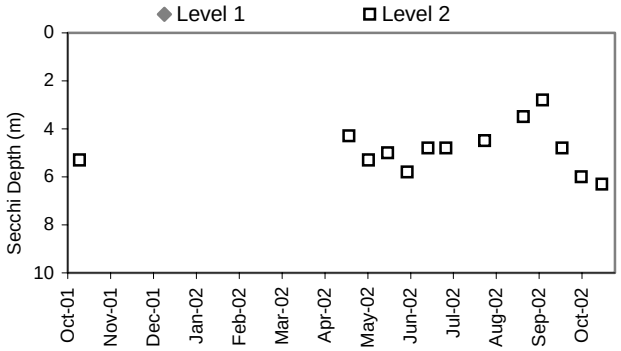
Watershed Map



Lake Temperature



Secchi Depth



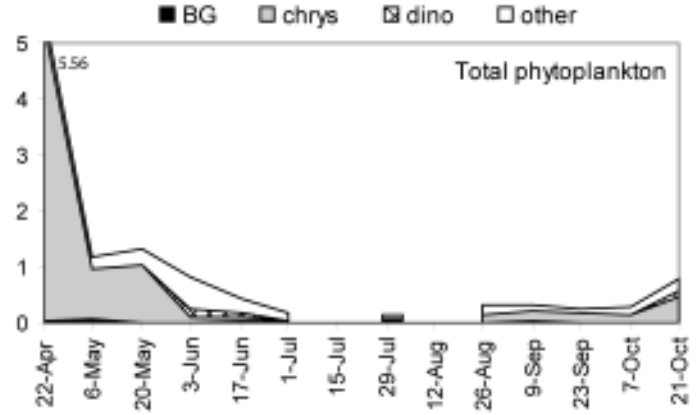
Lake Level and Precipitation

No Data Available

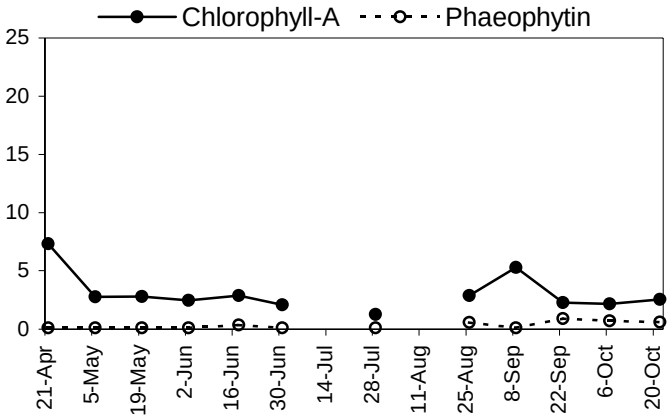
Secchi transparency was measured from April through October, ranging from 2.8 to 6.3m. Water temperatures ranged from 7.5 to 24.5 degrees Celsius during the same period. Water level and precipitation observations were not recorded.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton volumes were at their maximum during the first sample date and decreased rapidly to low values which remained for the rest of the sample period. Peak biovolume featured the chrysophyte *Dinobryon* and the diatom *Cyclotella.* Later populations were composed largely of chlorophyte species, the dinoflagellate *Ceratium* present, as well as small amounts of the bluegreen *Anabaena*. Chlorophyll content only generally related the phytoplankton counts, not recording the peak found on April 22nd and recording a small increase on September 8th, which was not reflected in the phytoplankton.



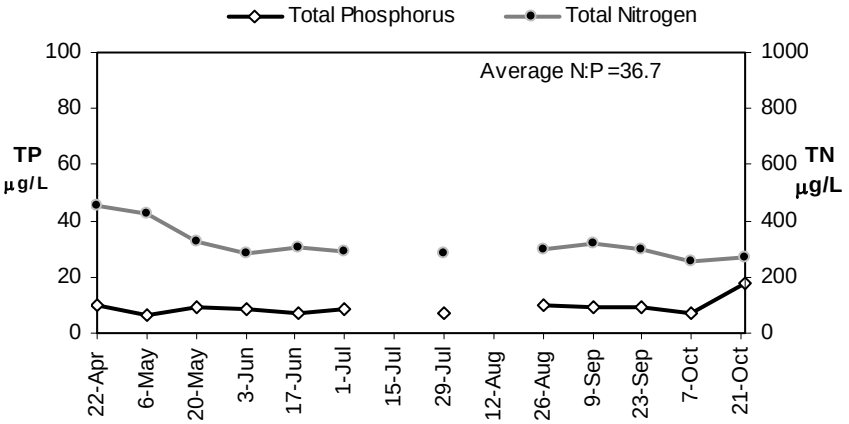
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

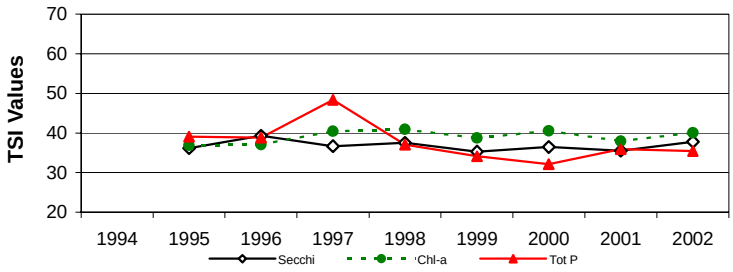


Nutrient Analysis and TSI Ratings

Total nitrogen decreased slightly over the first three dates and then remained steady, while total phosphorus rose on the last sampling date. The N:P ratio ranged from 16 to 63.

In 2002 the average TSI indicators were slightly more spread in the upper midrange for oligotrophy than they were in 2001, but still were fairly close together. While the indicators have been farther apart in recent years, they have remained in the same range since 1995, with only one exception, that of TSI-TP in 1997.



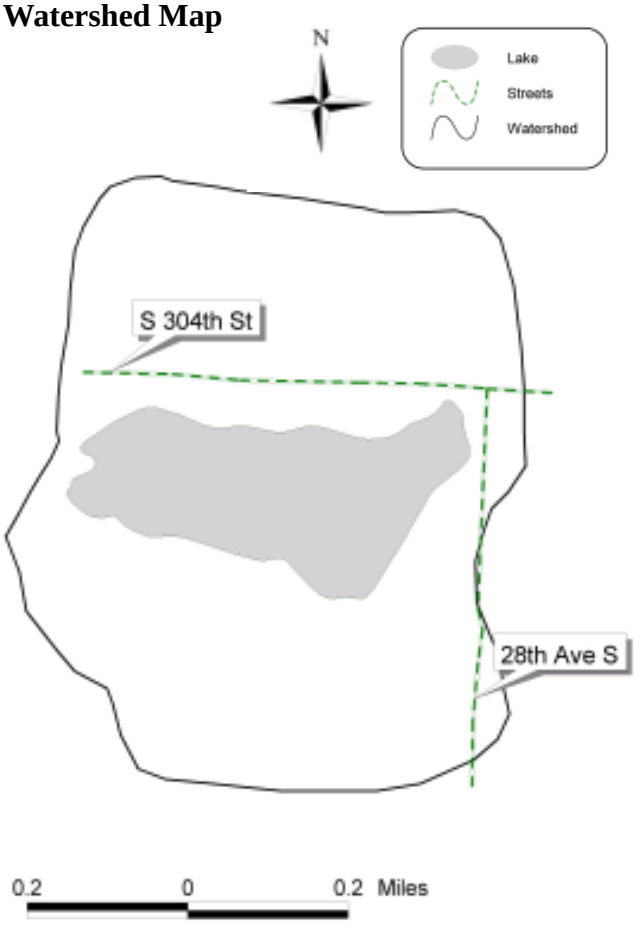


Overview

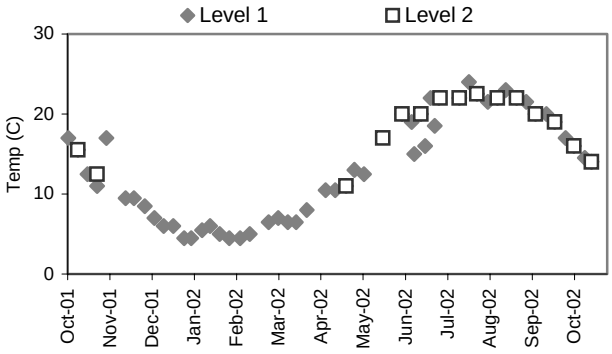
Volunteer monitoring began at Steel Lake in the 1980s and has continued through 2002, with a gap from 1991 through 1993. The data collected indicate this city lake (Federal Way) is relatively low in primary productivity (low range mesotrophic) with very good water quality. Since the lake surface makes up 18% of the drainage area, direct precipitation is quite important, in addition to surface and ground water inputs. There are no designated wetlands in the watershed (King County 1990). Current land use is largely urban residential, including a large city park and school property.

Steel Lake has a public access boat launch, and the lake has been recently treated for a pioneering Eurasian milfoil infestation, with a long-term plan adopted for control. Residents should keep a close eye on aquatic plants growing nearshore to catch any remnant patches of this, Brazilian elodea, or other aquatic noxious weeds.

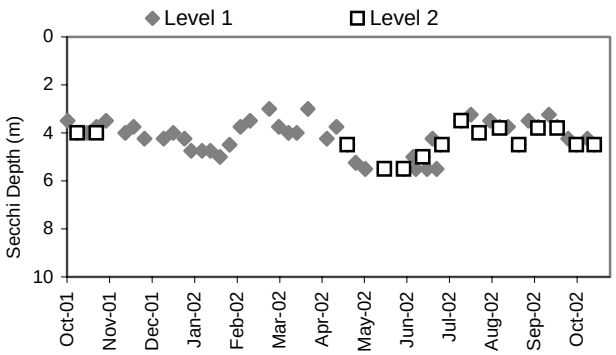
Watershed Map



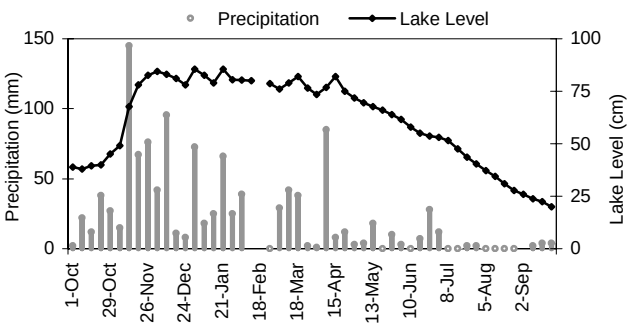
Lake Temperature



Secchi Depth



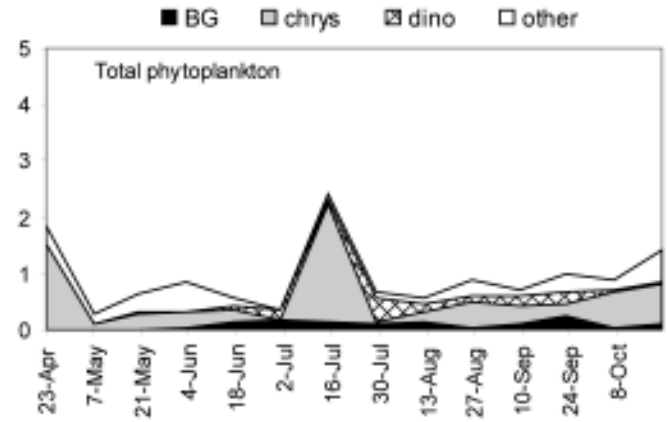
Lake Level and Precipitation



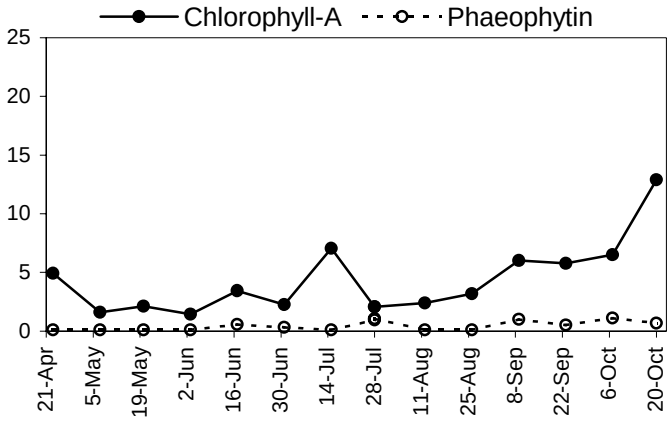
Secchi transparency ranged from 3.0 to 5.5m through the year. Annual water temperatures ranged from 4.5 to 24.0 degrees Celsius. . Water levels rose quickly in December and remained high in winter and dropped steadily after April in the pattern typical of lakes in the area.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton made a peak in June, but remained at low levels during the rest of the sampling season. Early populations of chrysophyte *Dinobryon* were replaced by an unidentified chrysophyte in June, accompanied by low levels of the blue-green *Anabaena*. A variety of taxa were present over the summer, including the dinoflagellates *Ceratium* and *Peridineum*, but none made very large populations. Chlorophyll content reflected the phytoplankton maximum in June, but showed a larger increase in October than did the phytoplankton counts. Phaeophytin (degraded chlorophyll) estimates remained at low levels through the sampling season.



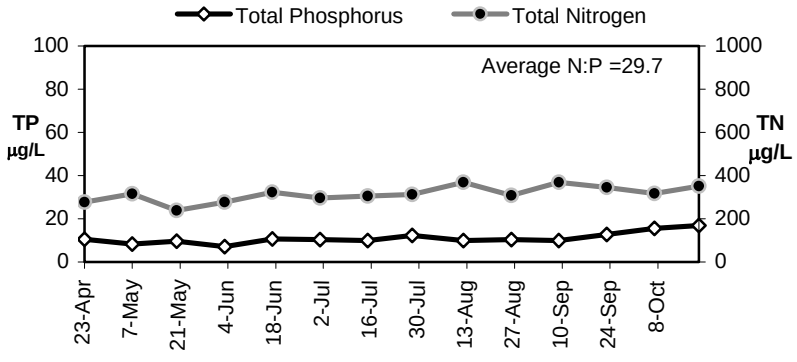
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

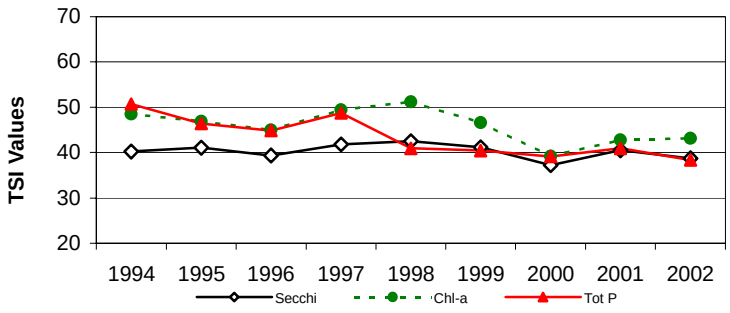


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in stable proportion to each other through the sampling period, with the N:P ratio ranging from 20 to 39.

In 2002 the average TSI-Chlor was higher than the other two indicators, just above the threshold between mesotrophy and oligotrophy. However, all three TSI average values have been very similar over the last three years. Before 2000, relationships changed between the indicators, with TSI-Secchi lower than the other two up to 1997 and TSI-Chlor significantly higher in 1998-1999.



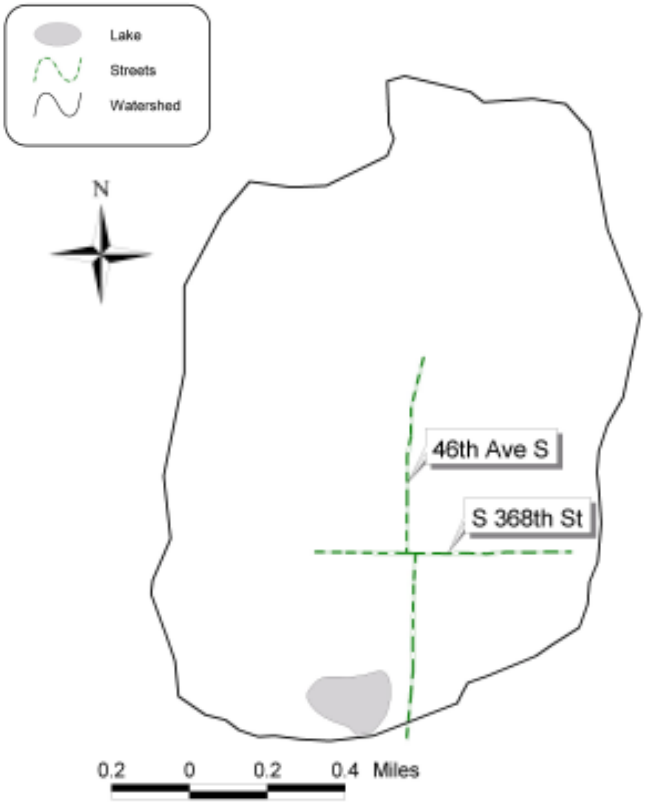


Overview

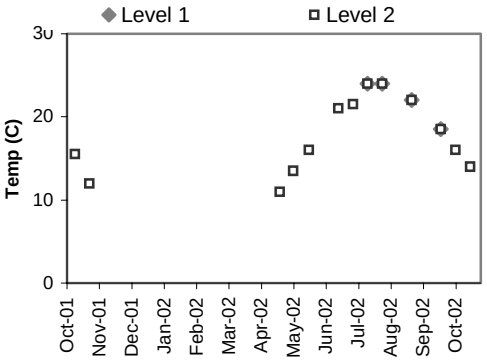
Volunteer monitoring began at Trout Lake in 1996 and has continued through 2002. The data collected indicate this lake is relatively high in primary productivity (borderline eutrophic) with good to fair water quality. Since the lake surface makes up less than 2% of the drainage area, direct precipitation is relatively unimportant compared to surface and ground water inputs. There are six Class II wetlands in the watershed; two are located along the shorelines of Fivemile and Trout Lakes (King County 1990). Both Fivemile and Spider Lakes are upstream from Trout Lake. Current land use is largely suburban residential, with support services and some open space as well.

Trout Lake has a public access boat launch, and residents should keep a close eye on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea, and other aquatic noxious weeds.

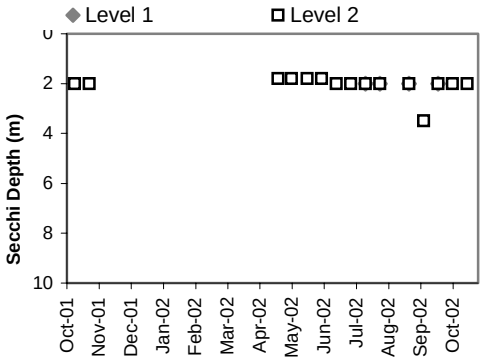
Watershed Map



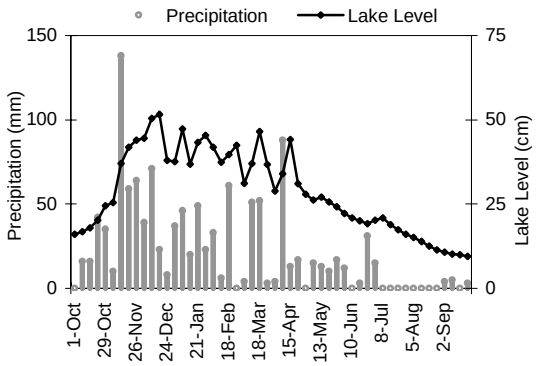
Lake Temperature



Secchi Depth



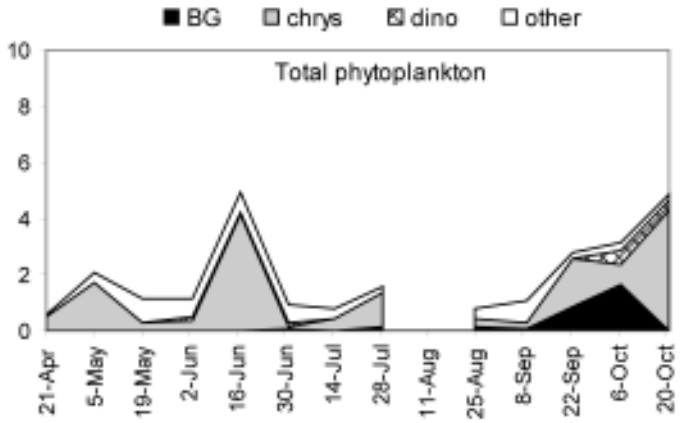
Lake Level and Precipitation



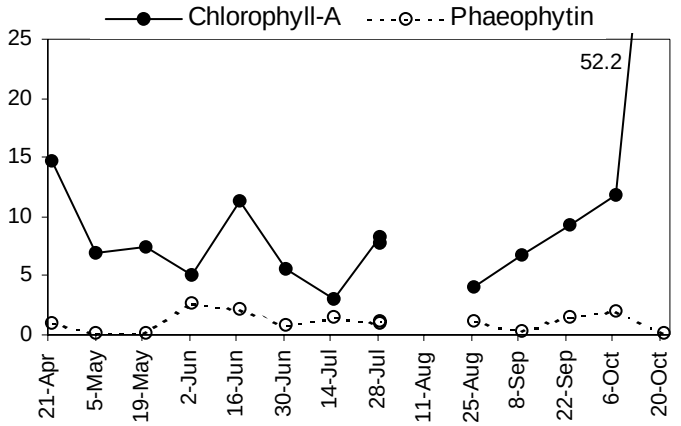
Secchi transparency ranged from 1.8 to 3.5m from April through October, but mostly remained around 2m. Water temperatures ranged from 11.0 to 24.0 degrees Celsius for the same period. Excellent precipitation and water level records were kept, describing a winter high-stand dropping steadily after April to an autumn low-stand, the pattern similar to many lakes in the region.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton made a peak in mid June and was increasing again at the end of the sampling period. The June maximum was dominated by the chrysophyte *Dinobryon*, while the October increase in October bluegreen *Aphanizomenon*, with a small amount of the dinoflagellate *Ceratium* as well. Chlorophyll content generally related to the phytoplankton values. Phaeophytin (degraded chlorophyll) was found in reasonably high concentrations at several points in the sampling season, which may be related to input to the lake from other sources or from bottom sediments mixing into the water column.



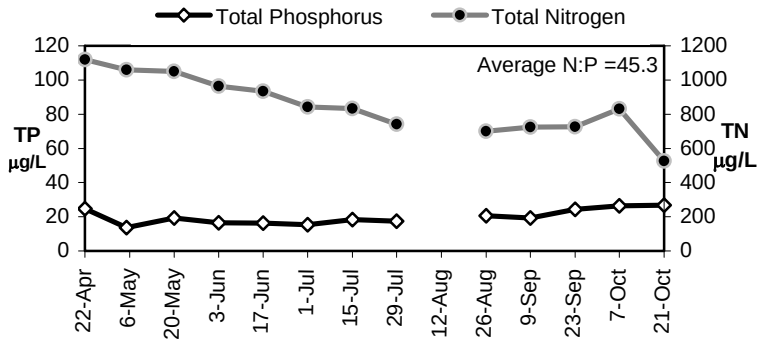
BG = Bluegreen; **chrys** = Chrysophytes;
dino = Dinoflagellates

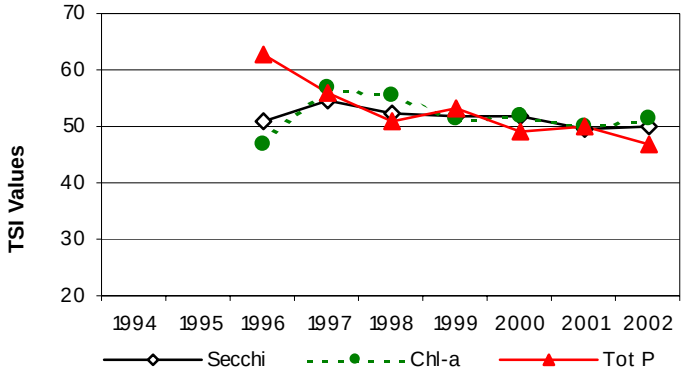


Nutrient Analysis and TSI Ratings

Total nitrogen decreased steadily until the end of July, although total phosphorus remained stabe through the same period. The N:P ratio ranged from 20, on the last sample date, to a maximum of 77.

In 2002 the averages of the three TSI indicators were fairly close together, on the borderline between mesotrophy and eutrophy. Since 1997 the values have been close together, and appearing to trend downward slowly, possibly signaling lower overall productivity and, consequently, better water quality.





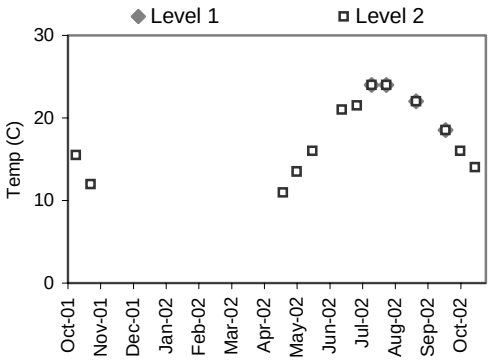
Overview

Volunteer monitoring began at Lake Twelve in the early 1980s and has continued through 2002, missing only 1997 and 1999. The data collected indicate this lake is generally moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 10% of the drainage area, direct precipitation is relatively unimportant compared surface and ground water inputs. There is a large Class 2 wetland along its eastern shoreline (King County 1990) that may contribute water to the lake occasionally. Current land use is largely as forest, with some recent harvesting, and a fringe of houses along the shoreline. There is an active mining operation to the west, and a berm built to mitigate noise drains to the lake.

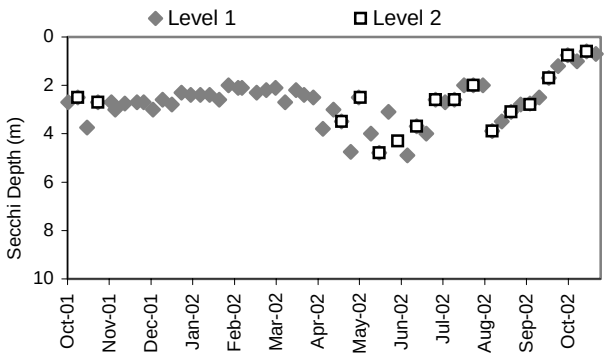
Lake Twelve has a public access boat launch, and an infestation of Eurasian milfoil was treated in the 1990s, but has since reappeared. Residents should keep an eye on this, as well as watch for other noxious weeds such as Brazilian elodea.

Watershed Map

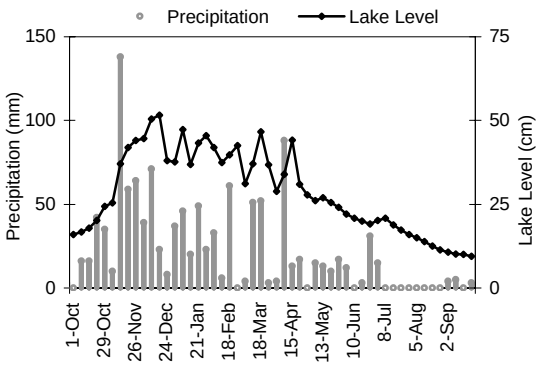
Lake Temperature



Secchi Depth



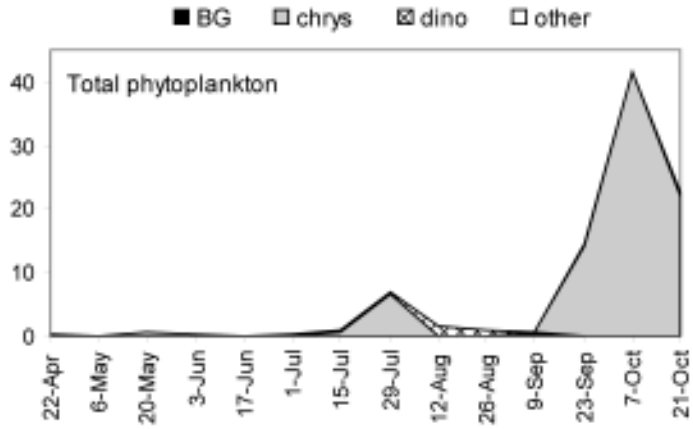
Lake Level and Precipitation



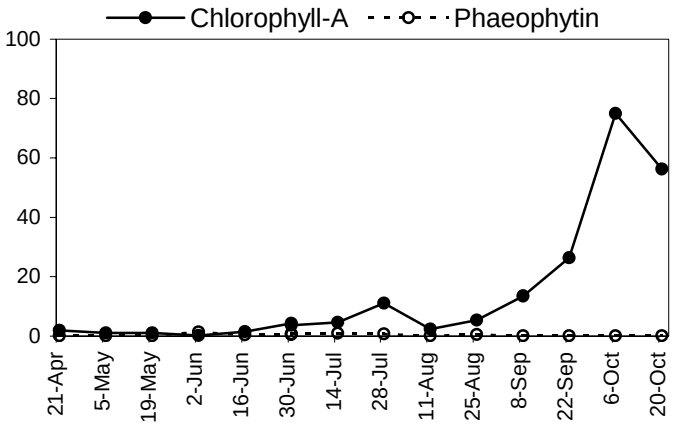
Secchi transparency ranged from 0.6 to 4.9m through the year, with low transparencies in the fall. Water temperatures ranged from 3.5 to 26.0 degrees Celsius. Excellent precipitation and water level records indicated a moderate winter high–summer low pattern, similar to other regional lakes.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton made a small peak in late July and a large peak in October. Both were dominated by the chrysophyte *Dinobryon*, but with differing subdominant taxa. In July *Dinobryon* was accompanied by the diatom *Cyclotella*, while in August it occurred with several dinoflagellates. Chlorophyll content did not accentuate the summer peak, although the October maximum was recorded. Phaeophytin (degraded chlorophyll) remained very low through the sampling period.

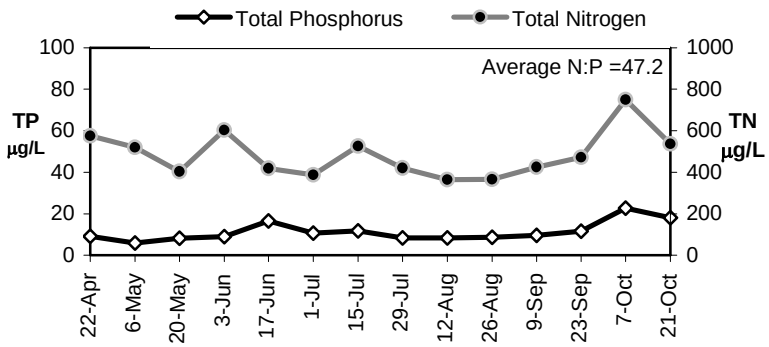


BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

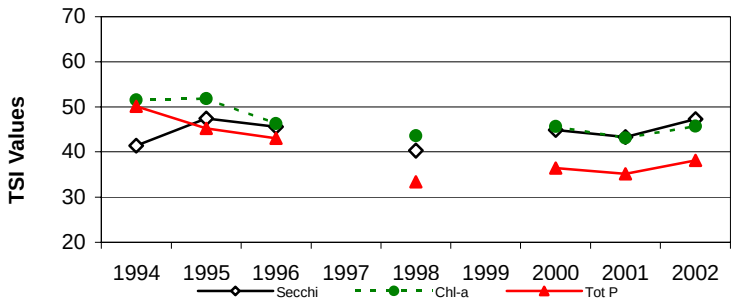


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in similar proportions to each other through the sampling period, aside from two dates with somewhat higher Total N (see chart). The N:P ratio ranged from 25 to 90.



In 2002 the average TSI-TP was significantly less than the other two indicators, similar to recent years. The other two indicators are close to each other and have been in the midrange for mesotrophy, while the TSI-TP has been in the oligotrophic range for the last three years of sampling.

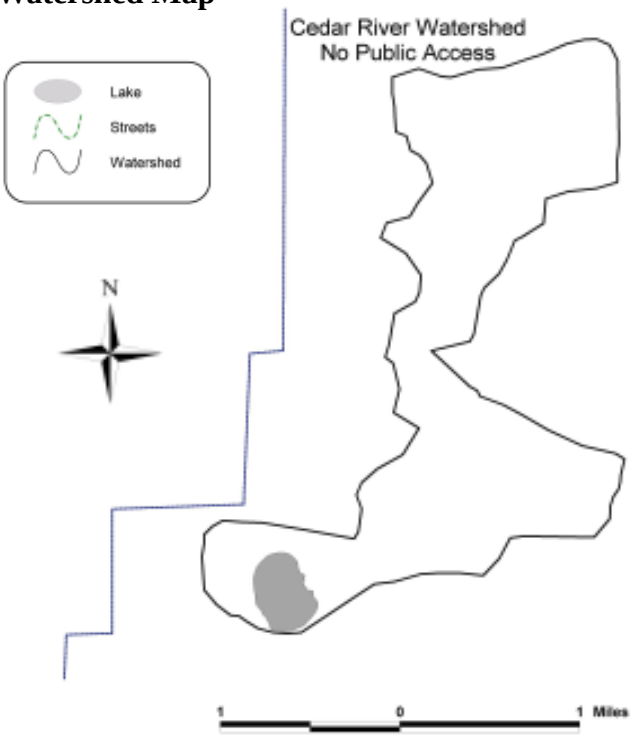


Overview

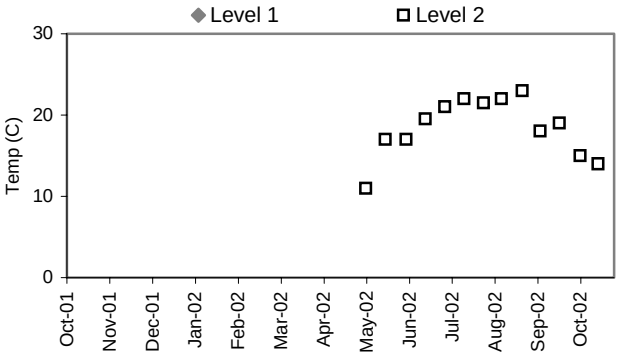
Volunteer monitoring began at Walsh Lake this year. The data collected suggest that this lake inside the restricted Cedar River watershed is relatively low in primary productivity (oligotrophic to mesotrophic) with very good water quality. Since the lake surface makes up 6% of the drainage area, direct precipitation is not as important as surface and ground water inputs. Extensive wetlands surround much of the shoreline. Current land use in the watershed is very restricted, protected as the domestic water source for the city of Seattle and suburban areas.

Walsh Lake has no access available to the public and no private ownership of land nearby.

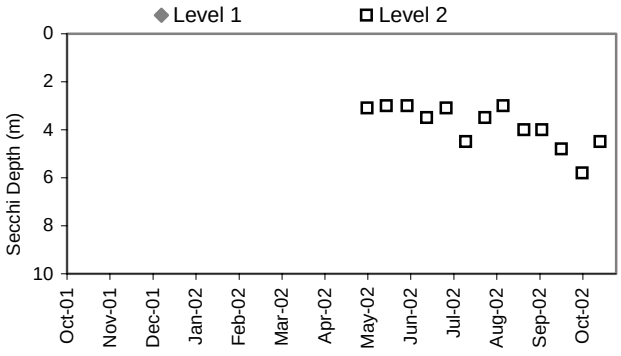
Watershed Map



Lake Temperature



Secchi Depth



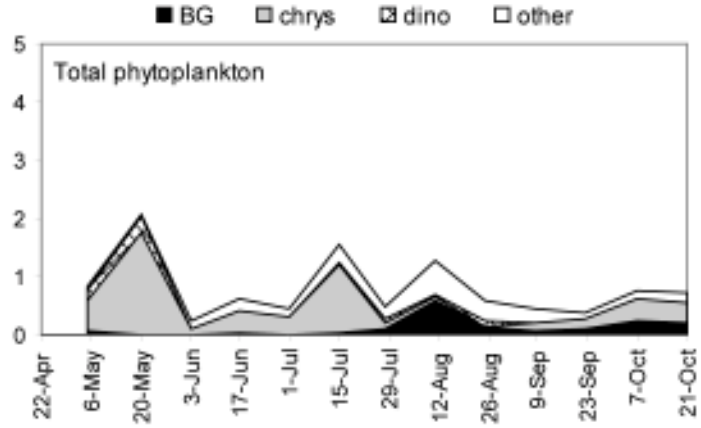
Lake Level and Precipitation

No Data Available

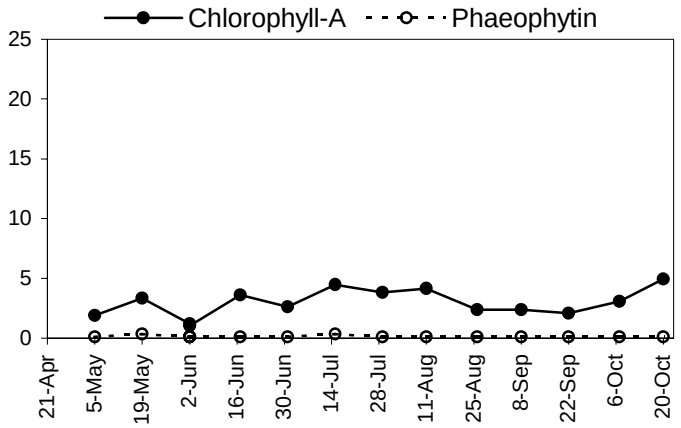
Secchi transparency ranged between 3.0 and 5.8m between April and October. Level II surface water temperatures ranged from 7.0 to 23.0 degrees Celsius. No water level or precipitation records were kept.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

Phytoplankton populations were relatively small, dominated in the first part of the season by the chrysophyte *Dinobryon* and the diatom *Cyclotella*, and later on by the chlorophyte *Crucigenia* and the bluegreen *Anacystis*. There were more algae in the first half of the sampling period than in the later months. Chlorophyll content was also low and did not record any distinct peaks. Phaeophytin (degraded chlorophyll) remained at very low levels through the sampling season.



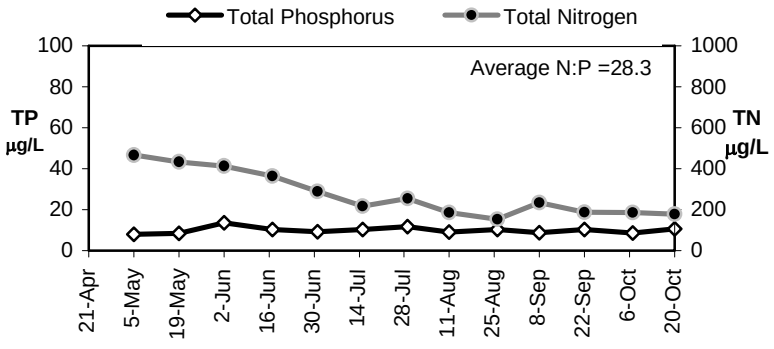
BG = Bluegreen; **chrys** = Chrysophytes;
dino = Dinoflagellates

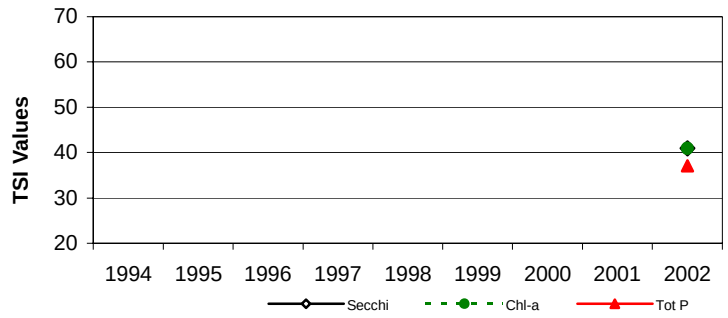


Nutrient Analysis and TSI Ratings

Total nitrogen decreased slowly from May through mid-July, after which it remained in fairly constant proportion to phosphorus for the remainder of the sampling period. The N:P ratio ranged from 15 to 58, with the lower values in the second half of the season.

In 2002 the average TSI-TP was below the other two indicators, in the upper range for oligotrophy , while TSI-Chlor and TSI-Secchi were very close together, just above the threshold of mesotrophy.



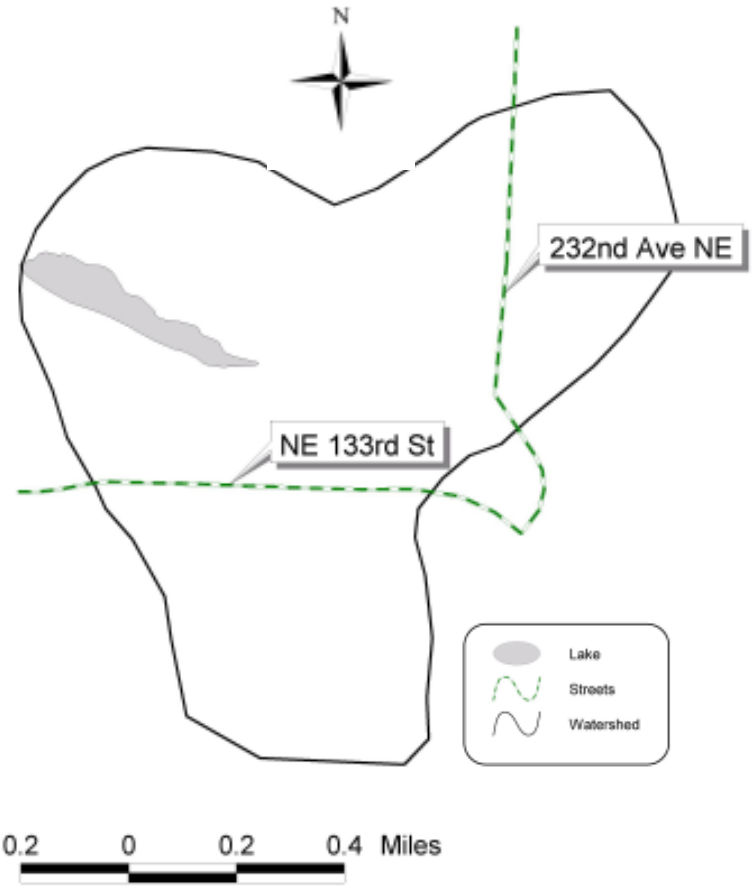


Overview

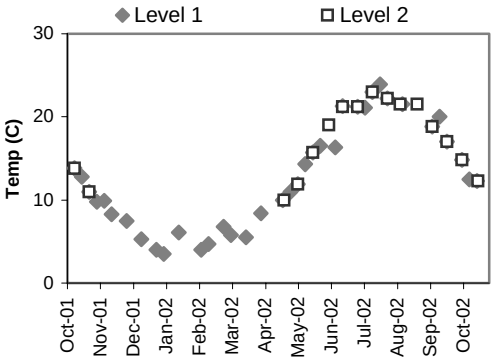
Volunteer monitoring began at Welcome Lake in 1996 and has continued through 2002. The data collected indicate this lake is moderate to high in primary productivity (mesotrophic to eutrophic) with relatively good water quality. Since the lake surface makes up only 3% of the drainage area, direct precipitation is less important than surface and ground water inputs. There is one Class I (B) and one Class II wetland in the watershed (King County 1990). Current land use is largely forested lands, with a development of suburban houses around the lake. There is a portion of an urban planned development under construction at the southern end of the watershed.

Welcome Lake has no public access boat launch, but residents should watch for Eurasian milfoil, Brazilian elodea, as well as other noxious weeds.

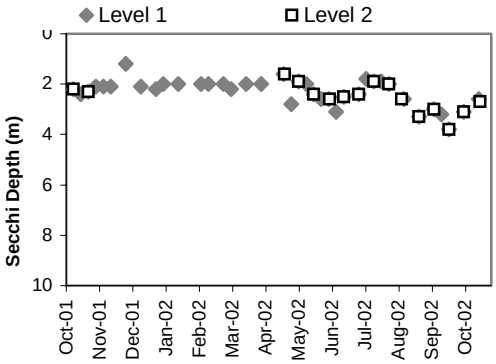
Watershed Map



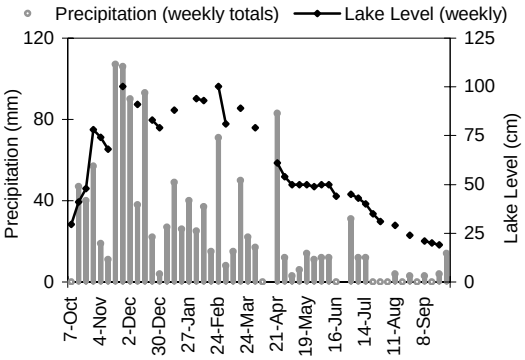
Lake Temperature



Secchi Depth



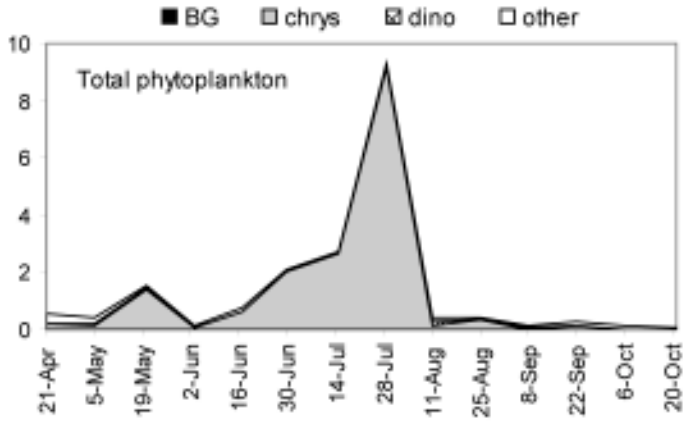
Lake Level and Precipitation



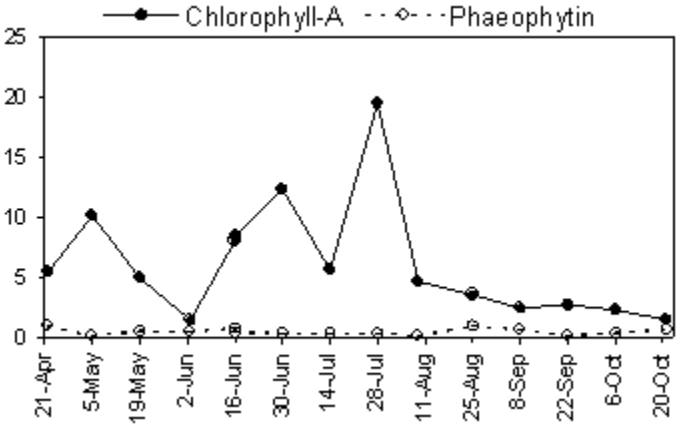
Secchi transparency ranged from 1.2 to 3.8m through the year, with a short gap in spring. Water temperatures ranged from 3.5 to 23.9 degrees Celsius. Water level and precipitation records were incomplete for the year, but indicated the wind high-stand, autumn low-stand of typical of many regional lakes.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton community was dominated by the chrysophyte *Dinobryon* over the sampling season, with only small amounts of a variety of other species. Chlorophyll content did not reflect the relative height of the summer peaks, although they were both represented. The chlorophyll data generally reflected the phytoplankton biovolume estimates. Phaeophytin (degraded chlorophyll) remained low through the sampling period.



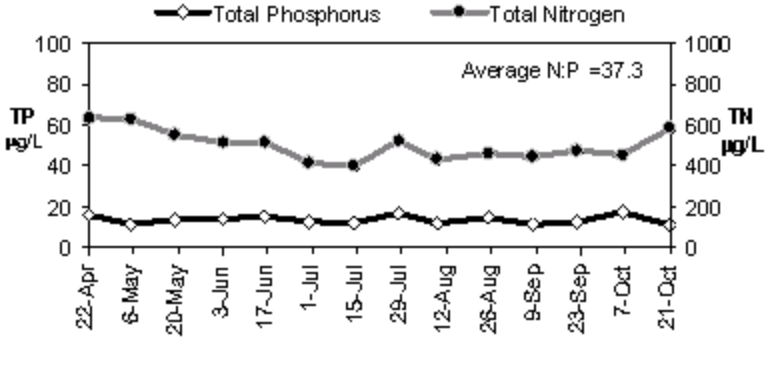
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

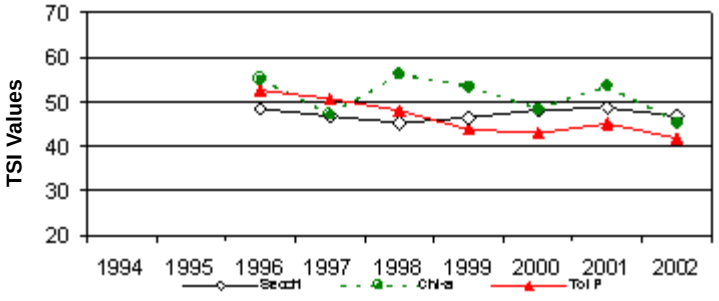


Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in relatively stable proportion to each other through the sampling period. The N:P ratio ranged from 26 to 54.

In 2002 the average TSI-TP was lower than the other two indicators, near the threshold between mesotrophy and oligotrophy. It declined every year since 1999, while TSI-Secchi has been relatively stable and TSI-Chlor has varied from year to year.





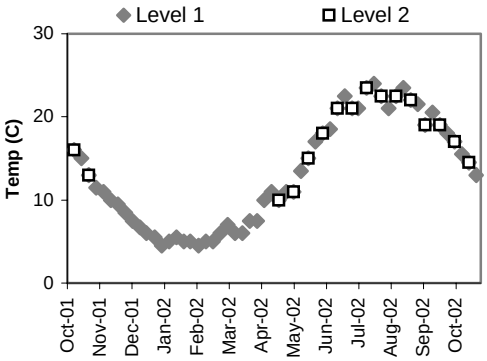
Overview

Volunteer monitoring began at Lake Wilderness in the early 1980s and has continued through 2002. The data collected indicate this city lake (Maple Valley) is moderate in primary productivity (mesotrophic) with good water quality. Since the lake surface makes up 20% of the drainage area, direct precipitation is very important, in addition to surface and ground water inputs. There is one Class I wetland, as classified by the King County Wetlands Inventory 1990, adjacent to the southwestern edge of the lake. Current land use is mixed residential and open space, with a large park along the western shoreline.

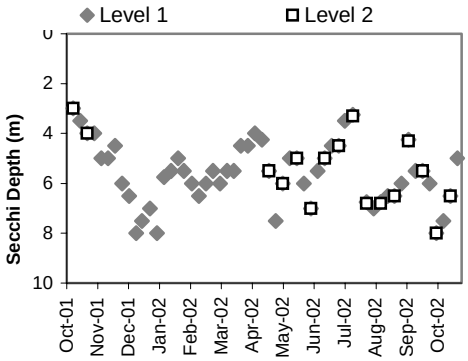
Lake Wilderness has a public access boat launch. There is a history of Eurasian milfoil infestation with control efforts by the lake community and the city of Maple Valley. Residents should watch for new patches of Eurasian milfoil, as well as other noxious weeds.

Watershed Map

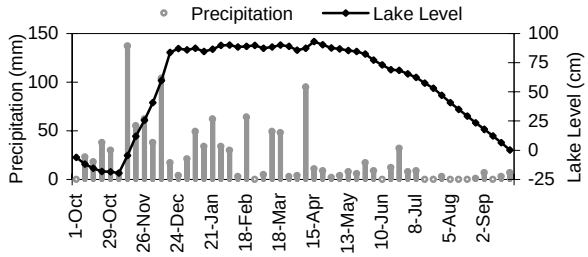
Lake Temperature



Secchi Depth



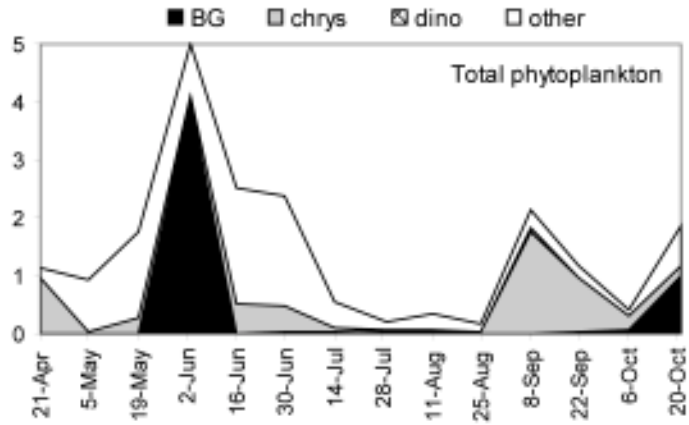
Lake Level and Precipitation



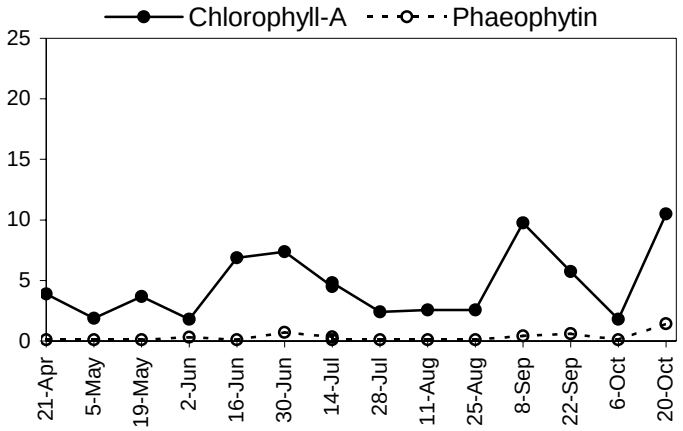
Secchi transparency was quite variable, ranging from 3.0 to 8.0m through the year. Annual water temperatures ranged from 4.5 to 24.0 degrees Celsius. Precipitation and water level records were fairly complete, indicating the winter high-stand to autumn low-stand pattern typical of area lakes.

Phytoplankton (mm 3/L) and Chlorophyll *a* Concentrations (µg/L)

The phytoplankton community made two distinct peaks during the sample season and was increasing at the end of October. The first peak was made by the blue-green *Gloeotrichia*, accompanied by a variety of chlorophytes including the chlorophyte *Botryococcus*. The second peak was dominated by an unidentified chrysophyte species, while the bluegreen *Aphanizomenon* increased in October. Chlorophyll content reflected the summer peaks, but did not track the magnitude of the June peak very closely. Phaeophytin (degraded chlorophyll) remained low through the sampling season.



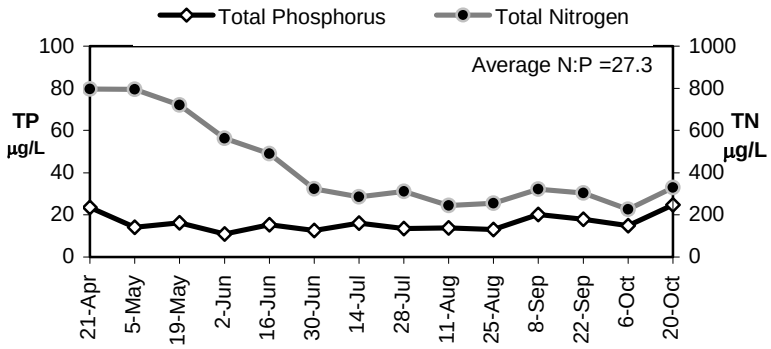
BG = Bluegreen; **chrys** = Chrysophytes; **dino** = Dinoflagellates

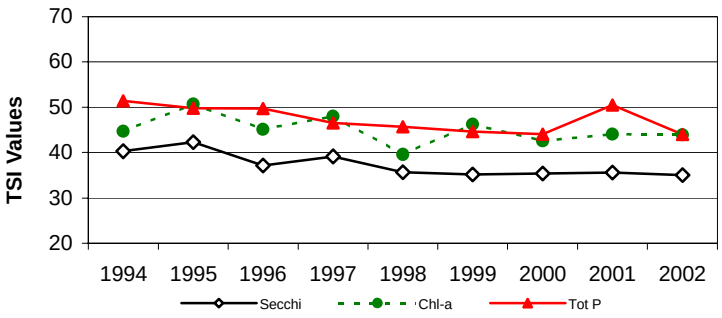


Nutrient Analysis and TSI Ratings

Total nitrogen decreased from April through the end of June, after which it remained in table proportion to phosphorus through the remainder of the sampling period. The N:P ratio ranged from 13 to 56, with the lower values in the latter part of the season.

In 2002 the average TSI-Secchi indicated oligotrophy, unlike the other two indicators which were in the mid mesotrophic range. TSI-Secchi has consistently produced lower trophic estimates through the years of sampling at Lake Wilderness.



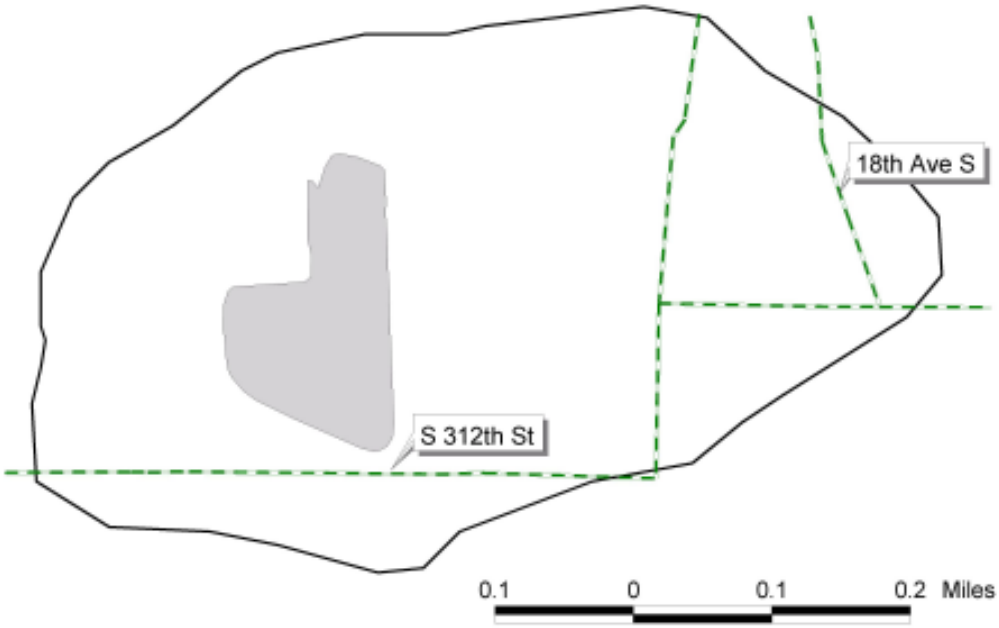


Easter

Overview

Volunteer monitoring began at Easter Lake in water year 1998 and has continued through 2002. Level I data only have been collected at this city lake (Federal Way). Since the lake surface makes up 9% of the drainage area, direct precipitation is less important than stormwater runoff and groundwater. Current land use is mixed urban residential and commercial.

Watershed Map



Easter Lake has no public access boat launch, but residents should watch for patches of Eurasian milfoil, as well as other noxious weeds.

Water levels increased from October through January and then began decreasing slowly with some variation to a very low stand by August when the level of the lake went below the fixed gauge. It had not risen to the lake gauge by the end of the water year. No data were available for temperature or Secchi transparency.

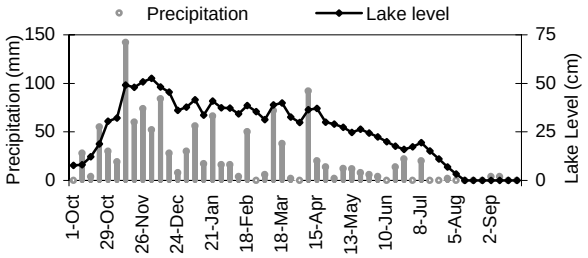
Lake Temperature

No Data Available

Secchi Depth

No Data Available

Lake Level and Precipitation



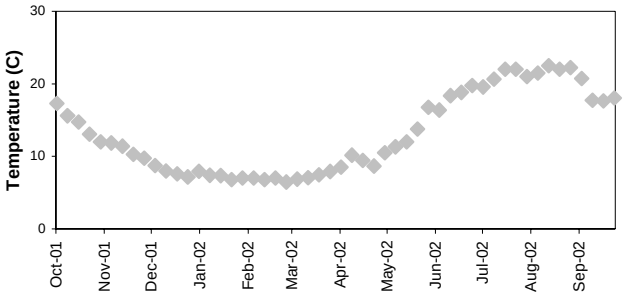
Overview

Volunteer monitoring for Level I began at Lake Sammamish in 1999 and has continued through 2002. The lake surface makes up less than 8% of the drainage area, so direct precipitation is less important than inlet streams, stormwater runoff and groundwater. There are multiple jurisdictions around the lake and in the watershed. Two major inlets (Issaquah and Tibbetts Creeks) run through the city of Issaquah, while the outlet exits through King County at Marymoor Park. Current land use is complex and mixed, but much of the watershed is currently experiencing suburban to urban development.

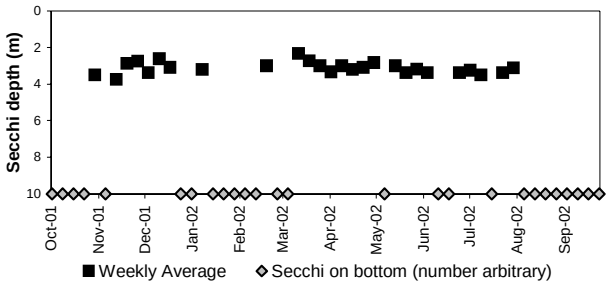
Lake Sammamish has a public access boat launch and several large parks. There is a history of Eurasian milfoil infestation and control efforts in various locations. Residents should watch for new patches of Eurasian milfoil, Brazilian elodea, as well as other listed noxious weeds.

Watershed Map

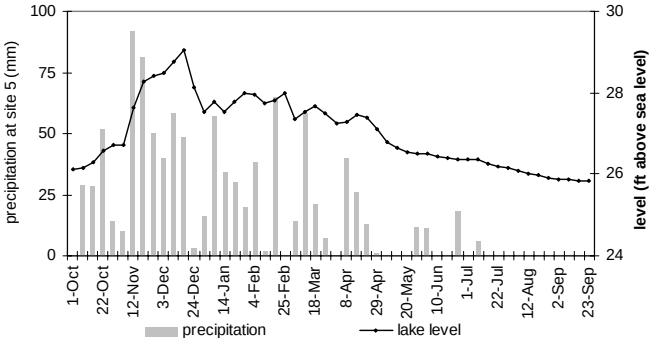
Lake Temperature



Secchi Depth



Lake Level and Precipitation



Secchi transparency ranged from 1.5 to 5.0m through the year among all volunteers, with an annual average of all data of 3.4m. Average daily water levels ranged between 26 to 27 feet above mean sea level, with abrupt increases apparently related closely to precipitation events. Annual water temperatures ranged from 6 to 25.0 degrees Celsius, with close agreement among the volunteer data.